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DECEMBER, 1959

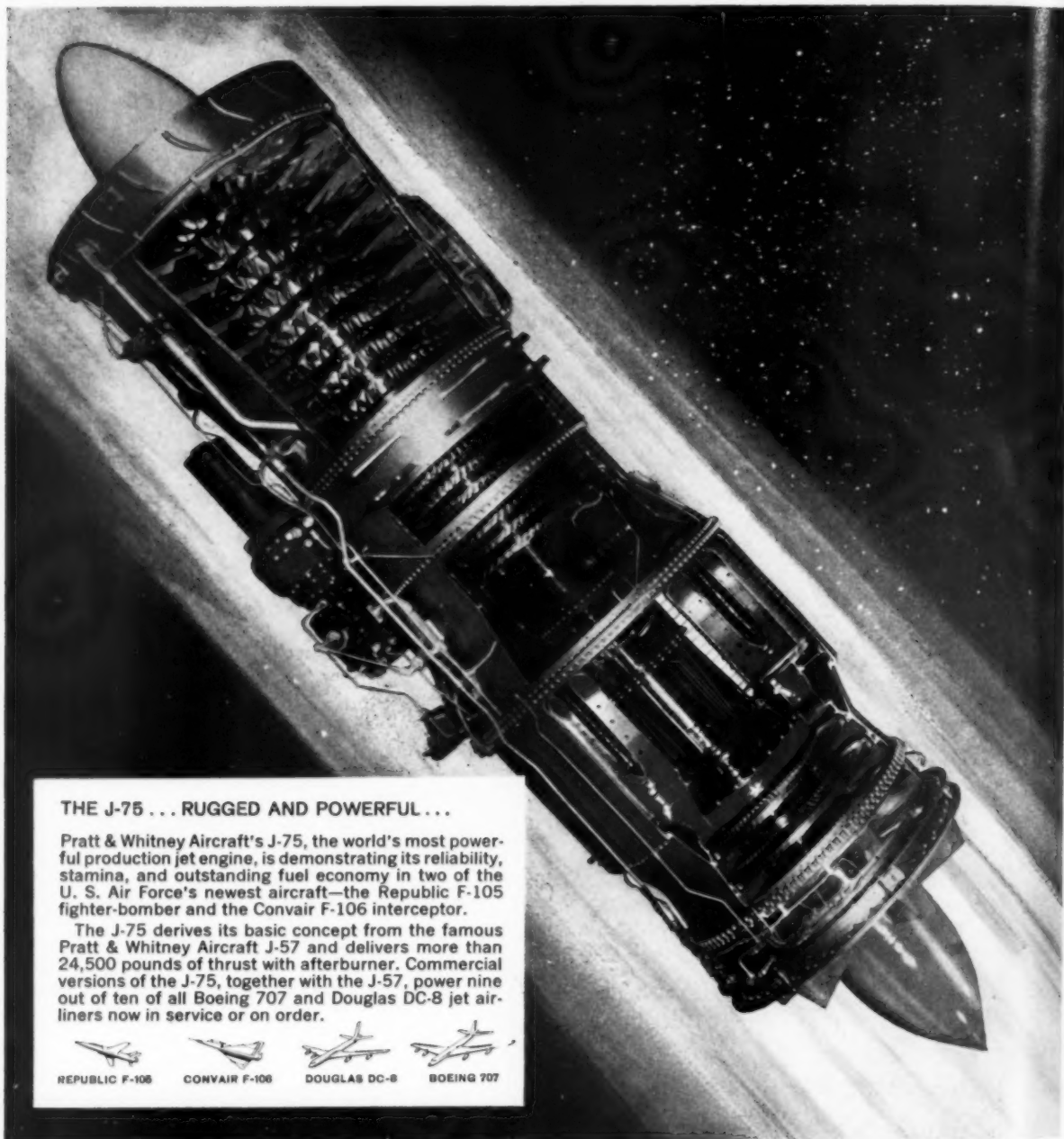


airlift

WORLD AIR TRANSPORTATION

In This Issue:

- P.O.'S FIRST MAIL LIFT PLAN
- EXCLUSIVE: 3RD QUARTER JET COSTS
- SABRE: FOR INSTANT RESERVATIONS



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DOUGLAS DC-8



BOEING 707

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(1959-1960)

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AIRLIFT

airlift

(U.S. Reg. Pdg.)

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WORLD AIR TRANSPORTATION

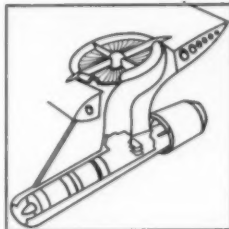
RESERVATIONS BREAKTHROUGH

Airline managements offer a confusing outlook on the future of reservations in the mass air travel picture. Some say yes, some no, and some don't know. American's C. R. Smith is strong on the yes side, has come up with the IBM Sabre as his answer. For details on what Sabre is and what it will do see page 23.



THE VTOL STORY

For the last four years, the code VTOL has instilled new hope in what had become a fading "convertiplane" market. But it has been mostly talk, a lot of testbed activity, and no solid action. For a view on what's holding up the VTOL, what it will cost to end the inactivity, read *AIRLIFT'S* exclusive interview with GE's David Cochran, page 31.



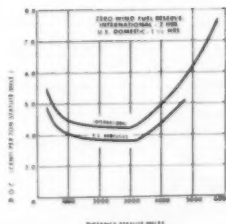
PROFILE ON ALITALIA

The sharp rise of Italy's flag airline from the weak role of a few years ago to that of a major competitor on the international scene has been dramatic. The name Alitalia has clicked and the names that have made it click are Carandini and Velani. For the inside details of their success, read Anthony Vandyk's analysis on page 24.



PRIORITY NO. 1: AIR CARGO

After a seemingly endless scramble of wishes, wants and needs for a "true" cargo airplane, one manufacturer has made it a top priority item. The name is Canada and its airplane, the CL-44. For an exclusive report on the momentum behind air cargo at Canadair, and its plans to push this big new market, see page 25.



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This Month's Cover: First of "interim" cargo airplanes, American Airlines' DC-7F Airfreighter, is loaded by forklift. AA made the first move in tabbing 10 retired DC-7 passenger aircraft for cargo service. United and Pan Am have since followed suit. The DC-7F hauls 35,000 lbs. of cargo coast-to-coast in eight hours, cruises at 350 mph.

Re-equip for the Jet Age... *with the*

SUPER

with proven

ALLISON PROP-JET

The Allison Prop-Jet Super Convair Conversion is the best buy in the jet age—costs much less than comparable new aircraft. Yet, it meets any jet-age performance standards for short- and medium-range service.

Its cruise speeds are up to 345 mph or as much as 80 miles an hour faster than piston-powered Convairs. Its climb rate from sea level is tripled—over 2,000 feet per minute. It can operate from 4,000-foot runways with weights up to 48,000 lbs. Full pay load range is 675 statute miles—550 miles greater than piston-powered Convairs. Block speeds are increased 25% to 30%. Outperforms all types of Convairs available today.

MORE TIME AND COMFORT FOR EXECUTIVES—In corporate service, the Allison Prop-Jet Super Convair can be a real boon to business.

For instance, it can sharply cut executive travel time—give key company officers more time for business on important trips.

It can virtually eliminate delays and missed appointments—because it has the power and range to fly above most foul weather.

Its noise and vibration levels are far lower than any piston-powered plane of comparable size—so executives get to their destinations fresher and more alert—are more rested when they return home. And pressurized cabins are available in arrangements to suit business needs.

Allison Unit Exchange Program for engines and propellers ends any delays for power plant overhauls.

MORE INCOME AND PROFIT FOR AIRLINES—Recent analyses of several domestic airlines show this jet-age ship will yield a 19% to 48% return on invested capital.

That's based on load factors of 40% to 58%—varies depending on interior configurations and whether the lines convert Convairs they now own or buy used ones in conversion.

Normal seating capacity ranges up to 58 passengers—can be raised to 77 on particularly heavily-traveled short segment routes.

There's extra passenger appeal in the high speed and low noise and vibration levels.

There's a big saving in capital investment over buying new aircraft when you get a Super Convair. Fewer Super Convairs can cover present routes—or airlines can cover longer



ALLISON

CONVAIR



POWER

longer routes with the same number of planes used now.

And there's Allison's Unit Exchange Program for engines and propellers to save even more capital. It cuts required inventory in spare engines 80%, in line station parts stocks 90%, and eliminates procurement of overhaul parts stocks by the operator.

FOR ANY AIRCRAFT OPERATOR—The Allison Prop-Jet Super Convaire is a real buy—and a proven ship. Its engines and Aeroproducts turbo-propellers have logged almost 1,500,000 hours of military and commercial flight time—its airframe has been in airline service for over seven years.

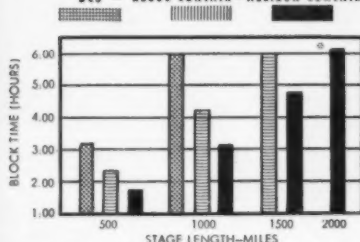
For full details on this great plane—complete information on our Unit Exchange Program—or a free analysis of your corporate aircraft or airline operations—write on your letterhead to:

Mr. William O. Watson, Manager, Sales & Contracts
Dept. 4C, Aircraft Engines Operations Allison Division
General Motors Corporation, Indianapolis 6, Indiana

CHECK THE CHARTS...
there's profit in Allison
Prop-Jet Super Convaire

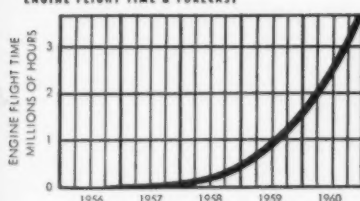
COMPARATIVE BLOCK TIME

DC3 — R2800 CONVAIRE — ALLISON CONVAIRE



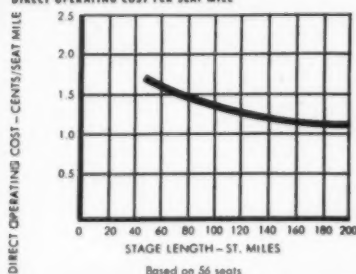
*With 2080 gallon fuel tankage (Standard tankage 1730 gallons)

ENGINE FLIGHT TIME & FORECAST



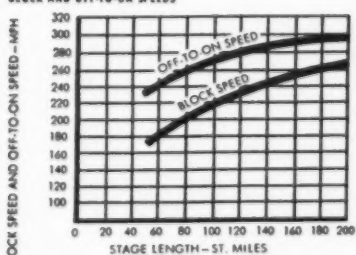
Allison Prop-Jet Engines—Military and Commercial

DIRECT OPERATING COST PER SEAT MILE



Based on 56 seats

BLOCK AND OFF-TO-ON SPEEDS



In-Flight Maneuvering Time: 3 Mins.
Ground Maneuvering Time: 5 Mins.

PROP-JET POWER



BRANIFF
luxury flights
... at no extra fare

Tet Power **ELECTRA**

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Electra flight is an exciting new experience
... quiet, smooth travel on the fastest
prop-jet airliner in the U.S.A. Truly a
rare adventure in modern travel elegance.

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"Gold Service" brings unqualified
enthusiasm from all. Superb is the word
for it! Air travelers enjoy the most magnifi-
cent meals aloft and the many thoughtful
"extras" ... at no extra fare ... aboard
Braniff's famed "El Dorado," DC-7C, or
the "New El Conquistador" DC-6.



Call your
travel agent or

BRANIFF *International* **AIRWAYS**

General Offices: Dallas, Texas



How Big the Battle for Survival in 1960?

Are the domestic trunk airlines facing a crisis in 1960? There are many who think so.

Excess seat capacity—excess in terms of expected demand—will become a reality well before next summer as more and more turbine-powered equipment goes into service.

Public acceptance of jets and the very high load factors that have prevailed on long-haul routes scarcely compensate for the uneasy feelings in many managements that a "battle for survival" is shaping up rather rapidly.

Jets are generating new business, but no one in the industry believes the "new" business can possibly fill the great increase in the number of seats that will be available when jet and turboprop deliveries are completed.

More than a few industry executives believe mergers will have to come among the twelve trunks, but there are few indeed who want to get specific about who's going to merge with who. There isn't one of the trunks that doesn't feel confident—at least openly—of making the grade in the coming battle for survival. Such determination, in fact, led to orders for equipment considerably in excess of over-all national requirements.

The spotlight is on the regionals, naturally, but it is not a foregone conclusion that a well-managed regional carrier must of necessity lose out to those carriers which tap multiple major markets. Yet it is clear that the regionals are going to be pushed competitively as never before. Control of the bulk of major markets remains, as it has for several decades, in the hands of the "Big Five."

The CAB has played an important role in the coming traffic battle. Some years ago it set out to strengthen the regionals, but in so doing the top carriers always came in for more routes, too. The fact is that the ratio between the "Big Five" and the other trunks has hardly changed through the years. Meantime the CAB has heightened the competitive battle by multiple competition on some routes in such a way that profitable operations for all are impossible.

The stakes in 1960 are very high. The competitive battle will get rough. Unless all of the signs and private forecasts fail, the "game of musical chairs" may well find a few participants missing by the time the music stops. Two billions in jet-powered equipment will force some major reshuffling. The struggle will not be long in getting underway.

Advertising to Whom?

Somebody said the other day that the battle of the jets is really a battle of advertising. Looking at the airline ads these days, one can only agree. We regret to say that the goal of today's ads seems to be to take business away from a competitor rather than to stimulate new business and encourage new markets.

Competitive advertising is healthy, of course, until it gets beyond reason, and we wonder about the impact on the public of some of the copy we've seen lately. Airline A's jets have the "most windows," Airline B's jets have the "largest windows," Airline C's jets are the "fastest," Airline D's are "the best," Airline E's have "the quietest coach section," Airline F's are "the most tested," and so forth and so on. Any similarity to TV tooth paste commercials?

Ten and twenty years ago the airlines were competing with the railroads and much of the ad copy was so directed. Now with the rails out of the picture, the ad copy is directed to competitors within the industry. Shouldn't it be directed to new business—and to the airlines' major competitor, the automobile? It is a false assumption to believe that the automobile is used only for short haul traveling. There are still a lot of people driving 1500 and 2000 miles in the belief that the private car is cheaper. If the jets are to live up to their advance billing, why not sell speed and price against the really big competitor which the industry has today.

When advertising baffles and confuses the public, then it is no longer effective. A change in pace, with a little ingenuity, might be in order.

Praise for Choppers

One of the real success stories of the airlift industry is the commercial helicopter and especially how it has made its mark in Chicago.

In the single month of October, Chicago Helicopter Airways carried 22,265 passengers—up 91% over the same month a year ago. In the first ten months of this year CHA carried 165,132 passengers, up almost 80%. This is an impressive record of public acceptance and use.

CHA is now overhauling the first Sikorsky S-58C ever to accumulate 3,000 hours, something of a tribute to both the airline and the equipment, especially considering the fact that the S-58C has been flying in military service since 1954 with not one of the military machines having passed 1500 hours of flying.

Wayne W. Parrish



Deluxe and Supercoach on every flight

Delta DC-8 True Jets are fastest over these routes

With their superior speed and smoothness, Delta DC-8's are naturally preferred by passengers over so-called "prop-jets" and other slower aircraft. But Delta occupies a warm spot in passengers' hearts for an even more enduring reason: whatever the aircraft, whatever the fare, Delta provides the service, courtesy and thoughtful hospitality that have made it first choice with air travellers for 30 years.



Only Delta offers true jets between these cities. More jet service to these and other cities coming soon.

*Reservations now being
accepted on all routes.*



DELTA
AIR LINES



Idlewild Shuns Private Fliers

To the Editor:

Enjoyed the article on Idlewild but would like to comment on one aspect of the operation there. The handling of corporate, private, and air taxi aircraft is a real disgrace! Granted, as your reporter says, "PNYA does not encourage such aircraft to use the field," nonetheless this traffic is growing for an obvious reason.

They are there picking up or taking passengers to the scheduled airlines. Yet there is no adequate parking area at the old domestic terminal. Light aircraft are sandwiched in between trucks and large aircraft and are allowed a total space less than one large plane spot. There are no waiting room or lounge facilities of any kind.

If you are unfortunate enough to have to park in the "Romeo" area reserved for private plane parking, you find yourself more than a mile from the terminal at the mercy of overworked Port Authority station wagons that frequently keep you waiting 45 minutes to an hour.

You tie your own aircraft down in an area apparently unprotected from groups of kids on bicycles who were climbing freely all over the planes the last time I was there. I waited 45 minutes and finally hitched a ride back, after walking part way, on the "fliteseer" train that happily came by.

As to the International Arrival Building, despite year-old assurances that air taxis would be given a gate or otherwise allowed to pick up or discharge passengers from the overseas carriers, to date we are forbidden to go to this area. Gate and ramp space are obviously no problem, since there is plenty of both, but to date we have had no luck in getting permission to use the area.

Complaints to the Port Authority bring the reply that facilities to handle general aviation traffic are in the "planning stage." It must really be long range planning since we have been getting the same answer with no improvement for five years!

Happily, some of the domestic airlines are aware of the problem, TWA and American particularly, and are making plans to handle this type of traffic at their new unit terminals. We certainly hope the other lines follow suit. The advent of the jets has accented public awareness of the time lost in getting to and from large terminals and we feel this will lead to increased use of air taxis. In fact, it already has. The airlines must realize the problem and plan for convenient transfer from air taxis, corporate and private aircraft to their own ships just as they plan for transfer from cars, buses and ordinary taxicabs.

SAMUEL FREEMAN, President
Somerset Air Service, Inc.
Somerset Airport, N.J.

Red Face Department

To the Editor:

The November *AIRLIFT* cites TWA as being first in on time performance for August with the 707 jets, 37.9 as against American Airlines 36.1. Upon adding the two columns for TWA 0-5 minutes late

(12.2) and 6-15 minutes late (15.7) it results in 27.9.

How about a big correction notice in the next issue just to keep the record straight and me happy?

G. T. Bradley
District Sales Manager
American Airlines
Minneapolis, Minnesota

Ed. Note: Looks like somebody goofed. Thanks for setting the record straight.

More Bouquets for AIRLIFT

To the Editor:

I want to take this opportunity to tell you how much I have enjoyed your magazine and how completely newsworthy I have found the new issues of *AIRLIFT* to be. You and your fine organization are certainly to be commended for the thoroughness of your reportorial services.

IRVING M. BUCKLEY
Executive Vice President
Trans Caribbean Airlines
New York, N.Y.

Take a Lesson

To the Editor:

One area of *AIRLIFT's* impressiveness has been left unpraised. Nothing has been said about its value to those of us who intend to make air transportation our future. In the last four years I have worked to build a background for an airline career. Reading is the only way to do this when actual work experience is denied because of college schedules.

AIRLIFT, in its comprehensive scope and continued examinations of airline and general air transport activities (as in the article on airline labor), has suddenly provided the student with an invaluable tool—something that gives both the information and the insight into the underlying issues. The magazine can be kept and used over and over again in the personal and school research projects that spring up continually.

AIRLIFT thus fills a need that is perhaps not readily discernible. An EAL district sales manager mentioned to me that a "tremendous lack of management potential" has been produced by the rapid expansion of front office forces. I believe that the people needed to fill management positions will come from the nation's universities in ever-increasing numbers, and, if their education can be effectively pointed toward eventual top airline management, the whole of air transport is bound to be benefited in the end. Your magazine is, from my own experience, very important to this "pointing."

I suggest that future issues explore the airlines occasionally with this educational information in mind. The efforts of the airlines to build their needed management potential are surely of great interest to today's management candidates. An intense desire to learn should always be cultivated as much as possible, and the dynamic nature of commercial aviation makes it much more imperative for this industry.

AIRLIFT has graduated from the specialized news magazine field and has be-

come the journal of all air transport. Along with the men who are commercial aviation, it also serves those who will be. And I feel confident that this service will be most vital to our industry. Certainly it can be added to your many contributions to the complex whose name you bear.

Thomas R. Oliver
4952 Chestnut St.
Philadelphia 39, Pa.

BOOKS

Aviation Directory—The Fall-Winter 1959-1960 edition of the World Aviation Directory, listing more than 30,000 executives, companies and aviation products, is available from American Aviation Publications, 1001 Vermont Ave., N.W., Wash. 5, D.C. Price: \$10 in U.S. and Canada; \$11 elsewhere. The Directory reflects a 63% change in key personnel, company and product listings over the past six months, departmentalizes air transport, manufacturing (aircraft, missiles, components), special services, government and international aviation.

When & Where

DECEMBER

- Dec. 1—ICAO, Facilitation Division, Rome (3 weeks).
- Dec. 2—Aeronautical Radio Inc. & Arinc Research Corp., board of directors meeting, Washington.
- Dec. 3—Flight Engineers, exec. committee meeting, New York.
- Dec. 7-9—ATA procedures sub committee on reservations, ATA conference room, Washington.
- Dec. 8-9—ATA passenger tariff committee, ATA conference room, Washington.
- Dec. 8-9—ATA personnel relations conference meeting, Lexington Hotel, New York.
- Dec. 9-9—Southwest Society of Aircraft Material & Process Engineers, 1st aerospace finishing symposium, Hotel Texas, Fort Worth.
- Dec. 15—ATA board of directors, ATA conference room, Washington.
- Dec. 17—Institute of the Aeronautical Sciences, Wright Brothers lecture, Natural History Bldg., Smithsonian Institute, Washington.

JANUARY, 1960

- Jan. 11-15—SAE annual meeting incl. aviation sessions, Sheraton Cadillac & Statler Hotels, Detroit.
- Jan. 12-13—ATA air express committee, Lexington Hotel, New York.
- Jan. 14-16—Agricultural Aircraft Assn., 10th annual convention, El Mirador Hotel, Palm Springs, Calif.
- Jan. 20-21—Airport Operators Council, board of directors meeting, Statler Hotel, Washington.
- Jan. 25-28—Institute of the Aeronautical Sciences, annual meeting, Hotel Astor, New York.
- Jan. 28—ICAO, Third Africa-Indian Ocean regional air navigation meeting, Rome (4 weeks).

FEBRUARY, 1960

- Feb. 24—ICAO, European-Mediterranean/Communications/rules of the air & air traffic services meeting, Paris (2½ weeks).
- Feb.—Flight Engineers, board meeting, New York.

MARCH, 1960

- March 10-11—Institute of Aeronautical Sciences, flight propulsion meeting (classified), Cleveland.
- March 14—ICAO, fifth North Atlantic Ocean stations conference, The Hague (2 weeks).

APRIL, 1960

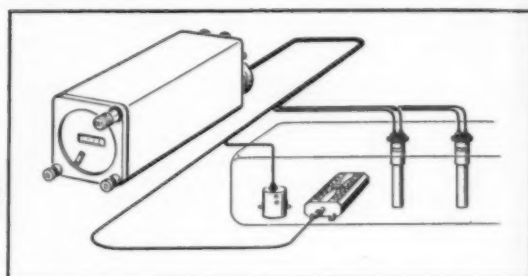
- April 5-8—SAE national aeronautic meeting, Hotel Commodore, New York.

LIQUIDOMETERS MEASURE THE VITAL FLUIDS OF THE DC-8

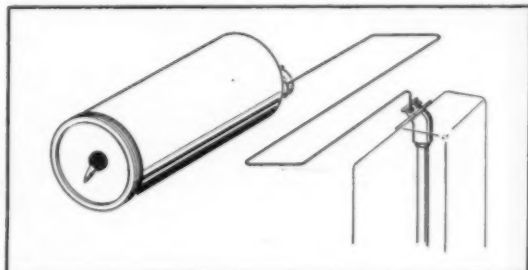


FUEL The Liquidometer Fuel Gaging System on the DC-8 measures fuel weight directly. It senses fuel density with a LIQUIDensitometer*, fuel volume with conventional capacitor type tank units, and combines the two measurements to indicate the **true weight** of fuel remaining. Ordinary compensated capacitor type gages only guess at fuel weight. They depend on the unpredictable relationship between fuel density and dielectric—can be in error by as much as 5%.

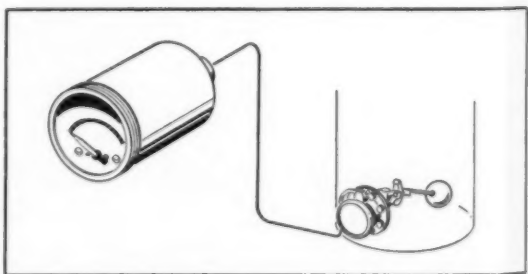
*Liquidometer trademark for its electric hydrometer.



ENGINE OIL Liquidometer Oil Gages for the DC-8 are capacitor type gages, each comprising an indicator-power unit and a capacitor type tank unit. The system is fully transistorized. Bridge and amplifier circuitry is housed within the 2-inch diameter indicator case.



HYDRAULIC OIL A simple float type Liquidometer gaging system indicates the liquid level in the hydraulic fluid reservoir. The gage operates on the ratiometer principle; features reliability with simplicity.



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SWISSAIR • TRANS-CANADA AIRLINES • UAT UNION AEROMARITIME DE TRANSPORT • and UNITED AIR LINES.



Air Freight Up Despite Strike

Air freight was hit hard by the steel strike and resultant auto factory shut-downs, but revenues are still almost 22% ahead of last year. Cargo officials had predicted a 22.88% gain this year over 1958. Estimate would have been exceeded substantially if it hadn't been for steel strike.

Don't be surprised if major equipment modernization comes soon at Capital Airlines, involving interim leasing of DC-6Bs and DC-7s.

Quietest Thrust Increase Yet

One big reason for United Air Lines' success in early DC-8 operations was an unannounced "crash" program to switch to the 13,500 lb. version of the Pratt & Whitney JT3C-6 engines with new inlet guide vanes. Project was expensive, cost close to \$500,000. Engines were changed at UAL's San Francisco base upon delivery from Douglas and every DC-8 entered service with the extra 2,000 lbs. of thrust. Result: higher nonstop transcontinental payload than would otherwise have been possible.

"Same old story" sums up new CAB appointments. Whitney Gilliland is an unknown to airlines, has political background, no regulatory or transportation experience. Alan Boyd rates a little better on basis of experience with a state regulatory agency. Third appointment, to be made when Chairman Durfee is confirmed for judgeship, will be only for one year, isn't likely to attract good talent since there's no assurance of reappointment for full six-year term. FAA Administrator E. R. Quesada, in his role as Presidential adviser, screened hundreds of names looking for non-political transport men to fill CAB spots. But one by one candidates refused to accept or wouldn't divest themselves of conflicting interests. One bright spot: likelihood that member Chan Gurney will be named 1960 chairman.

Mr. Q. Keeps A Promise

FAA Administrator Quesada kept his promise that federal aid airport funds wouldn't be spent for items unrelated to safety. Here's how the fiscal 1960 total (see page 15) is divided: 38% for runways, 34.1% taxiways and aprons, 16.7% land acquisition, 4.1% control towers, 3.8% lighting, 2.1% fencing, marking, roads and clearing—and only 1.2% for "other buildings."

Another IATA traffic conference won't be held unless there is a wide demand. BOAC's refusal to compromise its lower fare proposals at Honolulu meeting caused impasse (*AIRLIFT*, Nov.). If it remains adamant, another session would be fruitless. However, fare war isn't expected even if there are open rates after Apr. 1.

GPFI Decision Still Months Away

That important CAB decision in the General Passenger Fare Investigation is still months away. Board has allowed airlines to extend present tariffs until Mar. 31, 1960, to maintain status quo pending final action. Fare case is now more than three years old.

Past predictions that airports rather than airways would become the biggest traffic bottleneck are being borne out. FAA is losing ground in the battle, with holding delays of 35 minutes or more not uncommon. One of the worst offenders is FAA's own Washington National Airport.

Jet Shops Underway

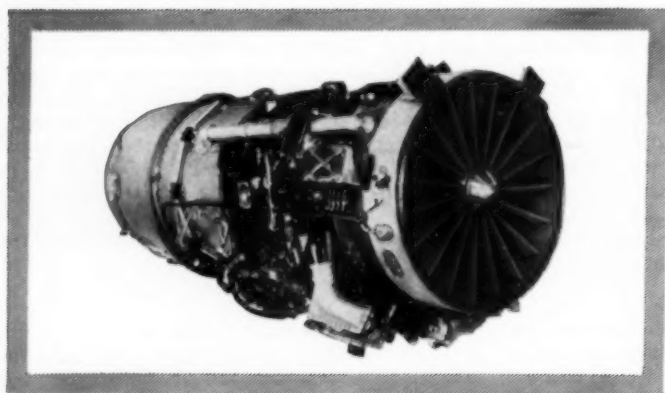
More airline turbine overhaul plans are shaping up. TWA management has given go-ahead on P&W jet engines, expects to handle JT4s on Boeing Intercontinentals from the start. Pan Am's Idlewild jet overhaul is entering pilot run stage and PAA is eyeing contract work for other carriers to help defray costs. American's jet shop has been operating for several months.

Big concern among air traffic control experts is trend toward increased ATC advisory services by FAA controllers, i.e., substitution of traffic information for traffic control. Feeling is it's not a solution; it increases workload of controllers already overburdened in some areas, and must be faced squarely by FAA. Outlook for action, however, isn't altogether dim. Next step will be expansion of positive control to high altitude operations in Chicago-Indianapolis area.

ROLLS-ROYCE BY-PASS JETS

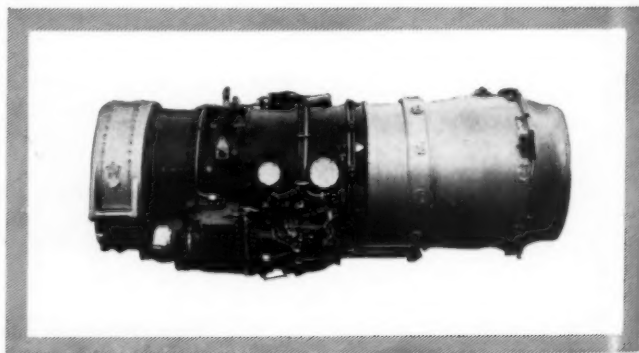
**are now flying in Boeing 707-420
and Douglas DC-8 jet airliners**

*The by-pass or turbo-fan principle proved by the
Conway is now generally accepted as the correct formula
for all high speed subsonic jet transports.*



Conway by-pass jets for civil use will enter service in 1960 at 17,500 lb. guaranteed minimum thrust. The Civil Conway is being developed to powers over 20,000 lb. thrust with improved fuel consumption, and will power the Vickers VC. 10.

The RB. 141 family of by-pass jets (10,000 lb. to 17,500 lb. thrust) have been designed to give the best possible operating economics for jet transport aircraft. The RB.141 of 14,300 lb. thrust will power later versions of the Sud-Aviation Caravelle and the RB.163 of 10,100 lb. thrust has been chosen to power the Airco DH.121.



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CPA-TCA DC-8 Agreement Revealed

Canadian Pacific Airlines' order for four Douglas DC-8s was placed after agreement was negotiated with Trans-Canada Air Lines for a joint servicing arrangement covering the turbojet equipment of the two Canadian carriers, *AIRLIFT* learned. Thus, operation of the same type of equipment, including Rolls-Royce Conway engines, will net important savings in maintenance costs for the two carriers. Overhaul of CPA's engines will be performed in Montreal. The four planes will cost \$6 million each, and CPA optioned five more.

Vancouver-based CPA had all but signed up for Boeing 707s when negotiations with TCA were consummated and the switch made to DC-8s to coincide with the TCA order. Another important phase of the agreement provides for CPA's use of TCA's simulator equipment in crew training.

The Canadian government approved the agreement.

New on the Order Books

Allegheny Airlines: tentative agreement with Napier Engines Inc. for five Convair 540s with Napier Eland turboprops, with options for several more.

Sabena: four Sud Aviation Caravelles, options on four more, raising total of firm Caravelle sales to 59.

New York Airways: option on first five 25-passenger Vertol 107 turbine helicopters for delivery in early 1961. Cost: \$470,000 each plus engines (GE CT58s).

Scandinavian Airlines System: two intercontinental Convair 600s (in addition to seven ordered by SAS and Swissair Sept. 30).

Compania Mexicana de Aviacion: three de Havilland Comet 4Cs for \$14 million, two to be delivered this month, the third in mid-1960.

Northwest Airlines: eight Lockheed Electras at \$52,239,900, raising its fleet to 18; first to be delivered Jan. 1, balance by August.

National Airlines: three Electras, increasing fleet to 15. Delivery: Sept.-Oct., 1960.

FAA Steps into Noise Problem

Federal Aviation Agency has moved in on the aircraft noise problem, as predicted last month by *AIRLIFT*. It has proposed noise abatement rules for Los Angeles International Airport, and although it emphasized that the action was purely local, other moves can be expected. The New York area undoubtedly will be next.

The proposal establishes a new traffic pattern, five miles in radius and covering all altitudes below 2,000 ft., for landing and departing aircraft. Approaching planes must maintain at least 1,500 ft. as long as practicable; planes taking off must climb to 1,500 ft. as quickly as possible. Preferential runways in no-wind conditions are 25L and R, taking jets out over the Pacific. Jets on westerly approaches to these runways must observe the 3-degree ILS glide path between outer marker and touchdown. FAA emphasized it was not abrogating "the authority of the pilot in command," who still has final say on runway use. However, any pilot not following the plan must file a report with FAA within 48 hrs. Deadline for comment on the proposal is Dec. 17.

Use Turbofans for Noise Reduction, Pyle Says

In the first such statement to come from a FAA official, Deputy Administrator James T. Pyle said airlines should

use the extra power from upcoming turbofan engines to alleviate the noise problem. The turbofan's promises of greater thrust and quieter takeoffs "will be realized only if the gross load of the airplane is not significantly increased," he stated, adding that airlines must "resist this temptation." Similar statements were made recently by Airport Operators Council and Port of New York Authority.

Pyle also warned that the last extension from 8,400 ft. to 10,500 ft. of maximum runway length under the federal aid airport program "is our final figure." No future aid will go for runways exceeding that maximum, he said.

1960 Airport Aid Outlined

A total of 288 airport projects will share apportionment of \$57,076,702 under the fiscal 1960 federal aid airport program, FAA said. Total voted by Congress under the stop-gap two-year extension of the program was \$63 million, but almost 40% of the FAA Administrator's \$15 million discretionary fund has been held back to take care of "contingencies and increasing construction costs." Fiscal 1959 program, leaving no leeway for price increases, divided \$63.6 million among 358 airports. Biggest 1960 share: California, \$6,169,737, for 17 fields.

AA Reorganizes; Rheinstrom Resigns

Major changes in American Airlines' management structure, including naming of G. Marion Sadler to the new post of v.p. and general manager and resignation of Charles A. Rheinstrom as executive v.p.-sales, have been placed in effect. President C. R. Smith said senior management members will concentrate on long-range planning, while younger officers conduct the day-to-day business.

Reporting to Smith are Sadler, former v.p.-passenger sales service; W. J. Hogan, executive v.p.-finance and planning; O. M. Mosier, executive v.p.-industry planning; George Spater, executive v.p. and general counsel; C. W. Jacob, senior v.p.-public affairs; Willis Player, v.p.-public relations.

Three new vice presidents, reporting to Sadler, are R. L. Fitzpatrick, v.p.-sales and services; F. J. Mullins, v.p.-field activities; Melvin Brenner, v.p.-schedules and equipment utilization. The controller and officers in charge of personnel, flight, technical services and organizational planning also report to Sadler. C. R. Speers, who has been senior v.p.-sales, was given special responsibilities for advertising.

Rheinstrom, whose resignation came as a surprise, will return to J. Walter Thompson, the advertising agency where he was v.p. and director before rejoining AA in April 1958. There was speculation at that time that he might be groomed to succeed Smith as president.

In another action, Carter L. Burgess, president of American Machine & Foundry and former president of TWA, was elected to AA's board of directors.

Railroad Invests in FTL

New York Central Railroad bought \$5 million of 5½% convertible notes of The Flying Tiger Line, and the cargo carrier will draw down the proceeds in 1961 for purchase of more planes. Notes are convertible to common stock at \$20 per share for 10 years and \$25 for five years thereafter. Planes to be purchased will be in addition to the 10 Canadair CL-44 turboprop freighters already on order at a cost of \$51 million.



IATA Bars Manufacturers

Strained relations between aircraft manufacturers and International Air Transport Assn. have reached the breaking point, with IATA's executive committee asking plane makers of five nations not to attend future annual general meetings. U.S. manufacturers said they would comply. IATA's paid staff has been blamed for the bad relations with the companies (*AIRLIFT*, Nov.).

In a letter to Aerospace Industries Assn., Society of British Aircraft Constructors, French, Dutch and Canadian manufacturers, IATA director general Sir William Hildred said companies had cooperated at the last two AGMs by confining their formal entertainment to a single joint function. However, he added, at Tokyo in October "activities of certain manufacturers gave rise to considerable adverse comment. Airline presidents found they could not venture into the hotel lobby without being accosted by manufacturers' representatives; when they wished to speak amongst themselves . . . they could not do so, and they questioned whether the AGM was the appropriate time for contact with manufacturers". Therefore, the executive committee, after "considerable soul searching", decided at Tokyo to ask manufacturers to stay away from future meetings, he said.

Texas Intrastate Line Planned

A new intrastate carrier, Lone Star Airlines, plans to open frequent service early next year between Dallas and Houston with Convair 240s purchased from American Airlines. David M. Segal, Denver financier, is principal stockholder. Fare will be \$10.80 plus tax (scheduled airlines' day coach rate is \$14.50 plus tax). Commuter tickets—10 seats on each flight available on a first-come-first-served basis—will be sold at 5% discount in books of 10. Hilton and American Express credit cards are to be honored.

Boeing, Vertol Talk Merger

Boeing Airplane Co. and Vertol Aircraft Corp. are to negotiate for acquisition of Vertol by Boeing. The deal would give Boeing, maker of long-range jet transports, entry into the short-haul field. The helicopter manufacturer would be a division of Boeing. Vertol's present management and present location, Morton, Pa., would be retained. Issuance of two Boeing shares for three of Vertol is planned. Boards of directors of each company and Vertol stockholders must approve the deal.

AA to Use 707 Speed Wing

A new speed wing modification for the Boeing 707 and the previously announced conversion to turbofan engines will result in a quieter "second generation" transport with speed in excess of 635 mph., American Airlines said. Conversion of AA's 707-123s to the new wing and engine will cost \$1.3 million per plane. Cost of converting the 707-023 (AA's designation for the Boeing 720) to the turbofan will be less because the speed wing feature will be an integral part of the plane.

Wing modification includes installation of a glove or "false" fiberglass leading edge between the inboard pylons and the fuselage, providing a greater cross-section area to the wing. First 707-123B will be ready for flight in November 1960; program will be completed in August 1961.

Frontier to Cut Service

Some routes awarded it by CAB in the Seven States Case aren't producing, Frontier Airlines says, adding that it will reduce service Jan. 1 and will ask Board permission to suspend the poorest segments. During the past year, FAL started new or additional service to 25 cities in four states. CAB estimated FAL's subsidy need at \$1,365,864 a year, but the airline says that with current low levels of passenger traffic it requires two and a half times that amount.

FAA Fines Airlines, Pilots

Recent FAA fines include: Pan American World Airways, \$1,000 for maintenance failure which immediately preceded loss of two wheels from a Boeing 707 on takeoff from Idlewild July 11; PAA pilot R. L. Buelteman, \$100, for landing a Stratocruiser on a closed runway at Honolulu May 21. He had been cleared to land on Honolulu International's runway 8, but in bad weather and visibility set the plane down on intersecting Hickam AFB runway 7.

Also, Regina Cargo Airlines, \$1,000 for putting a C-46 carrying 30 Marines back into the air after an engine required unscheduled servicing with 22½ gallons of oil (engine later found to have lost an exhaust valve); National Airlines pilot C. T. Bowes Jr., \$100, for violating reserved airspace over the White House.

Briefs

First Boeing 720 made its first flight on Nov. 23, weeks ahead of schedule. American has ordered 25, United 18, Irish Air Lines three. Meanwhile, the Boeing 707-220 was approved by FAA for airline operation. Braniff, the only carrier that has ordered the plane, which is a 707-120 with the larger JT4A-3 engines, will put it in domestic service Dec. 20.

Canadair's CL-44 turboprop freighter made its first flight last month. First planes are side loaders for RCAF. Swingtail versions have been ordered by Slick, Seaboard & Western and Flying Tigers.

A United Air Lines engineering team is studying Sud Aviation's short/medium range Caravelle for possible purchase within 90 days, UAL president W. A. Patterson said.

A \$20 million credit was approved by Export-Import Bank for Sabena, covering purchase of five Boeing 707s, plus 16 spare Pratt & Whitney engines and other equipment. Eximbank assumes \$12 million, seven banks guarantee \$6 million, and Boeing and United Aircraft \$1 million each.

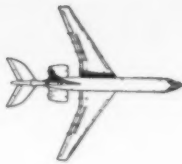
A \$56 million construction program was launched at LaGuardia Field, which will have a single-runway operation for most of 1960 due to work in progress. Airlines are switching about 82 daily flights to Idlewild and New York.

Beech Aircraft announced consumer list prices for three 1960 executive aircraft models: eight-place twin Super C 18, \$126,000; six-place H50 Twin Bonanza, \$95,500; six-place D50C Twin Bonanza, \$83,000.

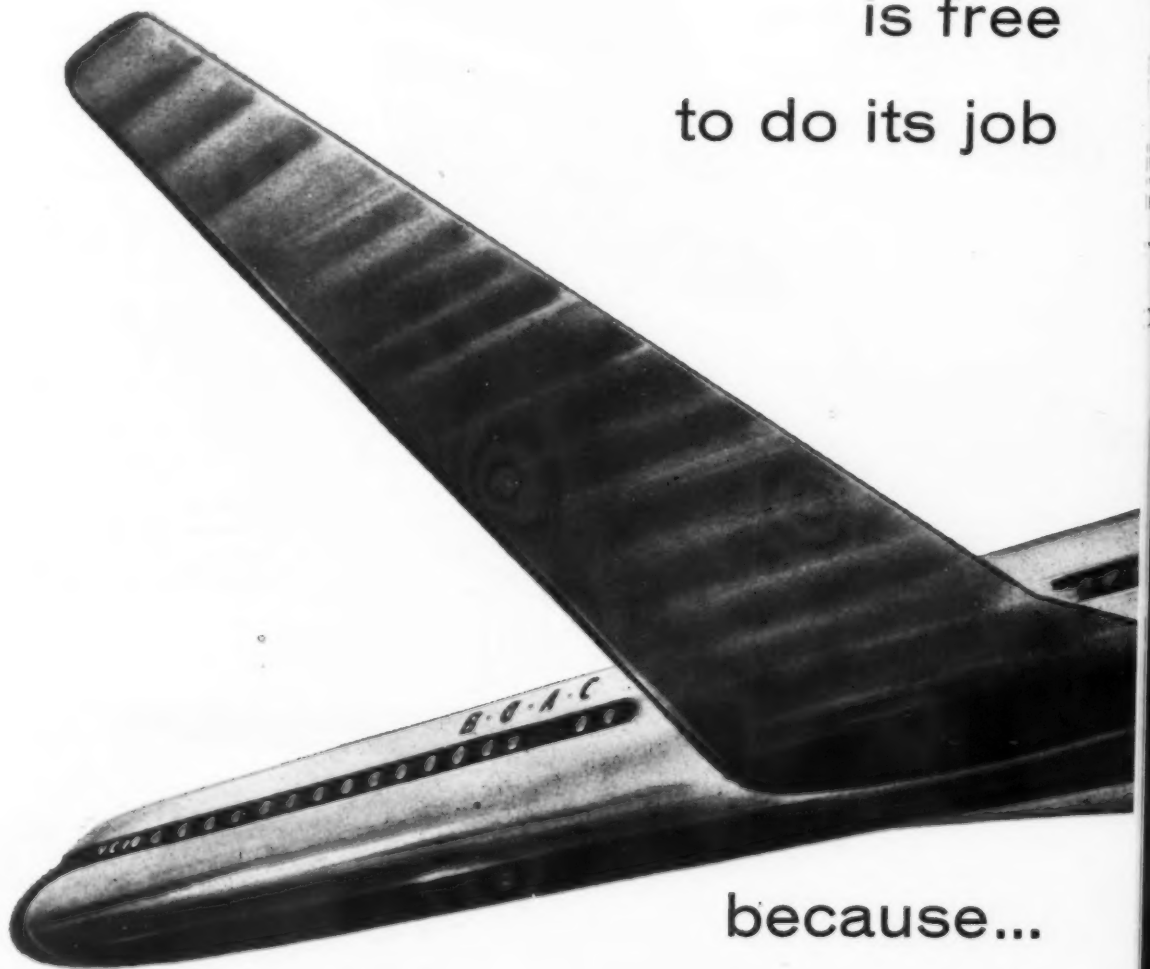
Aeronautical Radio Inc. on Dec. 2 marks its 30th anniversary—an outstanding 30-year span of contribution to all segments of aviation.

Stanley L. Seltzer resigned as executive director of Air Traffic Control Assn., effective Jan. 15, to rejoin Air Transport Assn. as asst. director-air navigation and traffic control.


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The wing
is free
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because...



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are in
the right
place

Here is *the* aircraft design of the future—with its clean, uncluttered wing and *rear-mounted* engines. Among its many advantages:

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- Better performance margins and unique payload/range capabilities
- Greatly reduced cabin noise—through-out
- No handling problems in critical "engine out" situations
- High-set engines practically eliminate debris intake risk
- Simpler maintenance from better systems access
- Reduced engine mounting structural difficulties

With all these—and many other—advantages, *rear-mounted* engines represent a momentous step forward in jet age design.

For complete data, contact Christopher Clarkson, U. S. representative, 10 Rockefeller Plaza, New York 20, N. Y.

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Donald W. Douglas, Jr.
President of Douglas Aircraft Company



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aircraft now on order by 18 certified air lines throughout the world.

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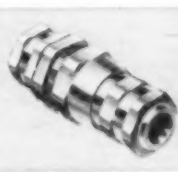
How can Aeroquip help you?



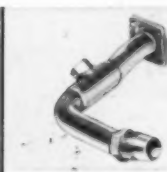
Aeroquip 666 Hose Lines of Teflon with patented Reusable "super gem" Fittings serve special high-temperature applications.



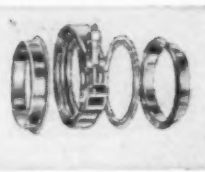
Aeroquip 601 High Performance Hose Lines and Reusable "little gem" Fittings are used on engine fuel and lube oil systems.



Aeroquip 5420 Self-Sealing Couplings are used on refrigerant lines of the DC-8's air conditioning system.



Aeroquip Precision Formed Tubing with integral hose fittings achieves exceptional weight savings and eliminates potential leak points.



Marmar V-Band Couplings, Channel Band Couplings, Instrument Mount Clamps and Band Clamps are used on the Douglas DC-8.



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Two important Thompson innovations in retread construction . . . fabric reinforcement and greater tread depth . . . combine to improve tire safety, protect casings for longer service and increase number of landings per tread by up to 50%. Fabric reinforcement acts as an insulator to reduce heat build up and permit tire to run cooler and resist abrasion. It keeps cuts from growing and penetrating casing. With extra tread depth of Thompson's patented slotted design that provides greater tire surface contact with runways, Reinforced Jet-Tred* stays on the plane longer, reduces costly downtime and schedule interruption, protects expensive casings for additional retreading.

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Rate Split Delays Mail Lift

By ERIC BRAMLEY

HOPES FOR IMMEDIATE full-scale expansion of first-class mail by air have been exploded.

Cause of the explosion: the rates the airlines were asked to accept for nonpriority mail. And unless there's a complete about-face by the Post Office or the carriers, the expansion plans will be laid aside for the time being.

That they will be implemented next year is a good possibility. The PO has little choice: railroads continue to drop mail-carrying trains.

As shown in the accompanying PO tables obtained by AIRLIFT, the plans call for addition of 70 pairs of long-haul points. There will also be six short-haul routes, plus service to Hawaii, Alaska and Puerto Rico.

It adds up to 34,500 tons (in addition to tonnage on present experimental routes, which would continue) a year and a net increase of 43,324,000 ton-miles. At an average of 19¢ a ton-mile, this would mean \$8.2 million more to the airlines. Last year, the trunks hauled 16 million ton-miles on experimental routes and received \$3 million at the 19¢ average. These routes are New York-Chicago, Washington-Chicago, from New York, Washington and Chicago to Florida, San Diego-Seattle, and local service lines.

The 19¢ figure, however, was the stumbling block. It's the rate offered by CAB for the expanded program, and is made up of 50% of the present line-haul rate for air mail and 50% of the terminal handling charge. But most lines objected, pointing out, for example, that it costs just as much to handle nonpriority mail in a terminal as air mail. Their rate proposals range from 24¢ to more than 27¢.

In order to get the program moving, the carriers said they would accept a temporary rate, subject to retroactive readjustment, while CAB attempted to iron out the differences. But the PO said it would only accept an 18-month interim final rate, not subject to readjustment.

Also, the PO says this mail is to travel space-available, and the airlines want to make sure this rule is uniformly applied. One proposed a regulation prohibiting any line from carrying it on any other basis. Another pointed out that the PO requires nonpriority mail to be carried within a relatively short time after delivery or that it be returned to the PO at the carrier's expense.

Thus, barring sudden change, it now looks like CAB will proceed with a full rate hearing in January, results of which probably won't be known until spring.

When the logjam is finally broken, here are the types of no priority routes planned:

Long-haul continental: 70 pairs of points, producing 28,900 tons and 42.4 million ton-miles yearly.

Short-haul: These six routes are Chicago-Minneapolis, St. Louis-Kansas City, Pittsburgh-Detroit, Atlanta-Tampa, Washington-Boston, Cincinnati-Nashville. They add up to 4,900 tons and 1.4 million ton-miles.

Off-shore: Seattle-Alaska, San Francisco-Honolulu, New York-San Juan, and Miami-San Juan, 709 tons and 1.3 million ton-miles.

Estimated Annual Volume of First Class Mail Potentially Available for Air Transportation Dispatched From and Arriving At . . .

NEW YORK				
	Arriving Tons	Ton-Miles	Departing Tons	Ton-Miles
Atlanta	411.95	313,906	725.45	552,793
Minneapolis	331.65	330,283	826.10	842,622
St. Louis	403.70	358,484	1,034.00	918,192
Kansas City	313.50	346,104	716.65	791,182
Denver	196.35	320,443	315.70	515,222
Dallas	317.90	439,020	792.55	1,094,512
Seattle	91.30	220,307	297.55	717,988
Portland, Ore.	72.60	177,653	356.40	872,111
San Francisco	432.85	1,116,753	1,267.20	3,269,374
Los Angeles	628.65	1,552,136	1,597.20	3,943,487
Total	3,200.45	5,183,091	7,928.80	13,517,485

LOS ANGELES				
	Arriving Tons	Ton-Miles	Departing Tons	Ton-Miles
Denver	195.80	166,234	239.80	203,590
Kansas City	100.10	136,937	86.35	118,127
St. Louis	112.75	179,385	155.45	247,639
Chicago	807.95	1,414,720	387.20	677,937
Boston	171.60	447,876	158.95	414,860
New York	1,597.20	3,943,487	628.65	1,552,136
Philadelphia	151.25	363,302	166.65	400,293
Washington	292.05	674,636	224.40	518,364
Dallas	220.55	274,585	281.05	349,907
New Orleans	88.00	148,016	116.05	195,196
Miami	78.20	200,505	91.30	234,093
Total	3,815.45	7,949,683	2,536.05	4,912,192

DALLAS				
	Arriving Tons	Ton-Miles	Departing Tons	Ton-Miles
Chicago	487.85	387,841	222.75	177,086
New York	792.55	1,094,512	317.90	439,020
Philadelphia	90.20	117,531	105.60	137,597
Washington	146.10	196,496	124.30	147,047
Miami	57.75	76,172	53.35	70,369
Los Angeles	281.05	349,907	220.55	274,585
San Francisco	193.60	285,947	172.15	254,266
Total	2,069.10	2,508,406	1,216.60	1,499,970

NEW ORLEANS				
	Arriving Tons	Ton-Miles	Departing Tons	Ton-Miles
Miami	50.05	34,685	82.50	57,172
Los Angeles	116.05	195,196	88.00	148,016
San Francisco	79.75	152,642	68.75	131,580
Total	245.85	382,523	239.25	336,776

MINNEAPOLIS				
	Arriving Tons	Ton-Miles	Departing Tons	Ton-Miles
Boston	114.95	134,951	79.75	93,626
New York	826.10	842,622	331.65	338,283
Philadelphia	122.10	120,024	75.90	74,610
Washington, D.C. .	192.60	179,311	84.15	78,344
Seattle	60.50	84,640	76.45	106,954
Portland	43.45	62,003	49.50	70,636
Total	1,359.70	1,423,551	697.40	762,453

Continued on page 22

DENVER				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
Kansas City	109.45	60,416	69.85	38,557
St. Louis	97.90	76,949	82.50	44,432
Chicago	301.40	273,973	130.35	118,488
Boston	54.45	96,244	40.70	71,958
New York	315.70	515,222	196.35	320,443
Philadelphia	39.05	61,621	47.85	75,507
Washington	117.70	175,138	64.00	98,208
Seattle	46.75	47,638	60.50	61,650
Portland	55.55	54,772	88.00	86,768
San Francisco	144.10	158,792	154.20	149,327
Los Angeles	239.80	203,590	195.80	144,234
Total	1,543.85	1,724,379	1,134.10	1,251,572

ST. LOUIS				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
Boston	139.70	146,685	96.80	101,640
New York	1,034.00	918,192	403.70	358,486
Philadelphia	157.85	129,753	116.05	95,393
Washington, D.C.	225.50	162,135	133.65	96,094
Denver	82.50	64,432	97.90	76,949
Seattle	28.60	51,480	33.55	40,390
Portland	24.20	42,761	43.45	76,776
San Francisco	107.25	186,186	89.65	155,632
Los Angeles	155.65	247,639	112.75	179,385
Total	1,955.25	1,949,263	1,127.50	1,200,745

KANSAS CITY				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
Boston	74.80	94,547	77.00	97,328
New York	716.65	791,182	313.50	346,104
Philadelphia	95.70	100,581	87.45	91,910
Washington	188.10	177,564	107.25	101,244
Denver	69.85	38,557	109.45	60,416
Seattle	30.25	47,523	30.25	47,523
Portland, Ore.	13.75	21,148	40.15	61,751
San Francisco	59.95	90,345	79.20	119,354
Los Angeles	86.35	118,127	100.10	136,937
Total	1,335.40	1,479,576	944.35	1,062,567

PHILADELPHIA				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
Chicago	982.30	457,159	701.80	469,504
Minneapolis	75.30	74,610	122.10	120,024
St. Louis	116.05	95,393	157.85	129,753
Kansas City	87.45	91,910	95.70	100,581
Denver	47.85	75,507	39.05	61,621
Dallas	105.60	137,597	90.20	117,531
Seattle	19.25	46,258	36.30	87,229
Portland, Ore.	15.40	37,283	22.00	53,262
San Francisco	114.40	288,860	117.70	297,193
Los Angeles	166.65	400,293	151.25	363,302
Total	1,730.85	1,904,870	1,533.95	1,800,000

CHICAGO				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
Boston	635.80	546,152	831.05	713,872
Philadelphia	701.80	469,504	982.30	457,159
Atlanta	190.30	112,658	353.10	209,035
Denver	130.35	118,488	301.40	273,973
Dallas	222.75	177,086	487.85	387,841
Seattle	67.45	117,305	155.65	269,897
Portland, Ore.	52.80	92,506	132.00	231,264
San Francisco	267.30	496,109	640.20	1,188,211
Los Angeles	387.20	677,987	807.95	1,414,720
Total	2,455.95	2,807,795	4,691.50	5,345,972

MIAMI				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
New Orleans	82.50	57,172	50.05	34,485
Dallas	53.35	70,369	57.75	76,172
Los Angeles	91.30	234,093	78.20	200,505
San Francisco	62.70	175,309	61.05	170,696
Total	289.85	536,943	247.05	482,058

ATLANTA				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
Chicago	353.10	209,035	190.30	112,658
New York	725.45	552,793	411.95	313,906
Washington	309.45	169,379	243.65	133,277
Total	1,388.20	931,207	845.90	559,841

SAN FRANCISCO				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
Denver	156.20	149,327	166.10	158,792
Kansas City	79.20	119,354	59.95	90,345
St. Louis	89.65	155,632	107.25	186,186
Chicago	640.20	1,188,211	267.30	496,109
Boston	139.15	377,792	109.45	297,157
New York	1,267.20	3,269,376	432.85	1,116,753
Philadelphia	117.70	297,193	115.40	288,860
Washington	232.10	569,220	155.65	380,253
Dallas	172.15	254,264	193.60	285,947
New Orleans	48.75	131,588	79.75	152,642
Miami	61.05	170,696	62.70	175,309
Total	3,023.35	6,680,455	1,749.00	3,628,353

SEATTLE				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
Denver	60.50	61,650	46.75	47,638
Minneapolis	76.45	106,954	60.50	84,640
Kansas City	30.25	47,523	30.25	47,523
St. Louis	33.55	60,390	28.60	51,480
Chicago	155.65	269,897	67.45	117,305
Boston	36.85	95,552	18.15	47,063
New York	297.55	717,988	91.30	220,307
Philadelphia	36.30	87,229	19.25	46,258
Washington	107.80	251,497	33.00	76,989
Total	834.90	1,698,680	395.45	739,203

PORTLAND, ORE.				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
Denver	88.00	86,768	55.55	54,772
Minneapolis	49.50	70,636	43.45	62,003
Kansas City	40.15	61,751	13.75	21,148
St. Louis	43.45	76,776	24.20	42,761
Chicago	132.00	231,264	52.80	92,506
Boston	26.40	68,930	14.30	37,337
New York	356.40	872,111	72.60	177,653
Philadelphia	22.00	53,262	15.40	37,283
Washington	88.00	206,976	28.05	65,974
Total	845.90	1,728,474	320.10	591,437

WASHINGTON, D.C.				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
Atlanta	243.65	133,277	309.65	169,379
Minneapolis	84.15	78,344	192.60	179,311
St. Louis	133.65	96,094	225.50	162,135
Kansas City	107.25	101,244	188.10	177,564
Denver	66.00	98,208	117.70	175,138
Dallas	124.30	147,047	166.10	196,496
Seattle	33.00	76,989	107.80	251,497
Portland, Ore.	28.05	65,974	88.00	206,976
San Francisco	155.65	380,253	232.10	569,220
Los Angeles	224.40	518,364	292.05	674,636
Total	1,200.10	1,695,794	1,919.60	2,760,154

BOSTON				
	Arriving		Departing	
	Tons	Ton-Miles	Tons	Ton-Miles
Chicago	831.05	713,872	635.80	546,152
Minneapolis	79.75	93,626	114.95	134,951
St. Louis	96.80	181,640	139.70	146,685
Kansas City	77.00	97,328	74.80	94,547
Denver	40.70	71,958	54.45	96,248
Seattle	18.15	47,063	36.85	95,552
Portland, Ore.	14.30	37,337	26.40	68,930
San Francisco	109.45	297,157	139.15	377,792
Los Angeles	158.95	414,860	171.60	447,874
Total	1,426.15	1,874,841	1,393.70	2,008,953

Hourly Breakdown of Outgoing Mail			
	10 p.m. (lbs.)	1 a.m. (lbs.)	Other Hours (lbs.)
Boston	3,919	4,766	453
New York	22,985	24,814	4,192
Philadelphia	3,916	6,143	.....
Washington, D.C.	7,587	2,681	2,319
Miami	386	243	991
Chicago	16,447	9,659	4,658
Atlanta	2,652	2,895	.....
Minneapolis	2,364	1,520	690
St. Louis	4,216	3,177	.....
Kansas City	3,650	2,541	.....
Dallas	3,082	4,121	775
New Orleans	297	586	686
Denver	3,320	2,711	1,407
Los Angeles	11,602	5,027	.....
San Francisco	5,234	6,235	.....
Seattle	1,672	922	.....
Portland, Ore.	996	1,103	.....



AA Computer To Handle 7,500 Bookings an Hour

WHAT'S THE "IDEAL" ELECTRONIC reservations system? What does a traveler have the right to expect from an airline in the way of reservations service?

American Airlines officials asked themselves these questions several years ago. Then they drafted their specs. At that time, it wasn't known whether this "ultimate" could ever be achieved. Now it has, AA says.

The answer: International Business Machines' SABRE (IBM 9090), a completely automatic, centralized reservations system—and the largest electronic processing system ever devised for business use. It will be able to handle 7,500 reservations per hour.

Installation will begin in late 1961, and most AA cities will be linked by the end of 1962. When completed, 1,100 reservations desks in 61 cities will be connected to one computer, located in the New York area, via 10,400 miles of leased phone wires.

Cost: For the completed system, AA will be paying IBM \$5 million yearly in equipment rental and maintenance.

AA had also been wondering whether the red tape connected with present reservations would bog down the system as the airline got more and more into mass travel, and make it necessary to operate "no-reservations" flights. Now, president C. R. Smith says: "SABRE will permit both mass travel and personalized reservations service."

Dramatic, revolutionary improvements will result from the new system. Examples:

The machine will keep passengers' names, phone numbers, etc. No longer will this information be written on cards, which can get lost, mis-filed, etc. On a given day, AA now has as many as 1 million reservations records on file. Average time to complete the processing of a card, including filing, is 45 minutes. SABRE does it in seconds.

No-shows caused by airline clerical errors are avoided. Canceled space is opened for re-sale in three seconds.

Overselling of flights is eliminated.

Sending of on-line reservations message via teletype—a tremendous traffic—is eliminated.

\$5 Million a Year = Instant Reservations

SABRE (a code name, not an abbreviation) will also:

Quote fares for most itineraries; maintain and process waiting lists; supply information on departure and arrival times for the current day's flights; send teletypes to other airlines requesting space, follow up the messages if no reply is received, and answer requests for space from other airlines; advise agents to check on passengers who have not picked up tickets within the time limit; prepare special reports on traffic. It could also handle air cargo.

SABRE consists of three elements: the processing center; the network of 10,400 miles of phone lines, and the agent sets, or consoles. In one location, instantly available to all offices, will be the complete status of all legs of all AA flights—seats already reserved, seats available, names, etc.

Here's how a typical transaction will be handled: A customer calls AA in New York for a seat to Chicago "sometime tomorrow." The agent selects from a file an air information card showing all New York-Chicago flights, and inserts it in the console. She pushes buttons for date of trip and number of seats requested, presses an "availability" button and lights show next to the air information card, opposite all flights with open seats.

When the customer makes his choice, the agent pushes the "sell" button. The machine then tells her, on a display printer, what she has sold—flight, date, number of passengers, destination, departure time—and subtracts the space from the inventory.

The agent then uses a typewriter-like keyboard to give the machine the passenger's name, home and business phones, name of person making the reservation if other than the passenger, time limit for ticket pickup. The information is displayed on the printer and is transmitted to the computer item by item. The computer acknowledges receipt of each item by transmitting a reply to the agent, who then presses an "end transaction" button. The machine then checks the record for completeness and notifies the agent of any omissions. If none, it signals "o.k."

Throughout this process, the machine monitors the agent, and makes it difficult for her to make a mistake.

Suppose you were in Dallas, and wanted to make a New York-Chicago reservation for the following week. The same procedure applies. Or suppose you were in Memphis and wanted to change your Chicago-Los Angeles space from next Thursday to Friday. The Memphis agent gets from the machine, in a matter of seconds, your complete record, checks availability, and makes the change. Your original Thursday seat is available for resale in three seconds. There are no messages to be sent, no manual changes in records.

And suppose, in changing this reservation, the Memphis agent makes a mistake. Your name is Berdell, and she asks the machine about Burel. The computer will "deny" that it has a Burel on that flight, but will print out Berdell's name and record. It's 99.3% accurate in this respect.

Although SABRE'S cost will be \$5 million a year, one item alone—making canceled space available for resale within three seconds—will go far toward paying for it, AA believes. In addition, there will be substantial savings from elimination of teletype messages, from elimination of reservations cards and the work that goes into filing them, and from wiping out clerical errors that result in no-shows.

IBM says that SABRE works in millionths of a second, and that all agent sets could interrogate the computer simultaneously, with little delay in the answers. And AA says it determined before committing itself for the system that "super-reservationists" won't be needed to operate it.

Besting a pack of 10 contenders which sprang up in the wake of WW II, Italy's bustling airline has come of age in a hurry. That's why they say . . .

Alitalia's Big Secret— Rags to Riches

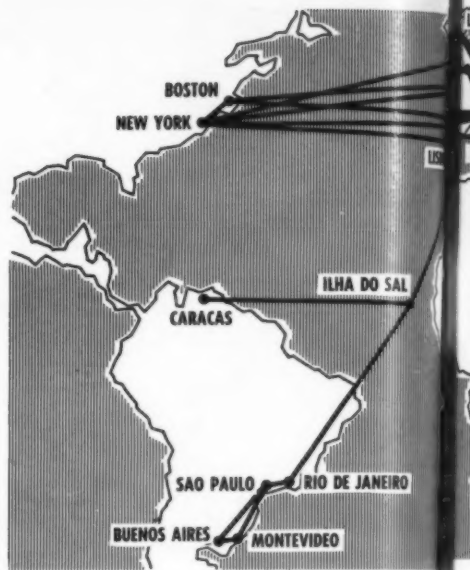
ROME, ITALY—Two men, one a diplomat and the other a technician, have been largely responsible for the phenomenal "rags to riches" transformation of the Italian air transport industry in recent years. These two men, Count Nicolo Carandini and Bruno Velani, president and general manager, respectively, of Alitalia, have built up from a heap of postwar confusion an airline which is now well on its way to becoming one of Europe's best.

Carandini, veteran lawyer, diplomat and politician, was closely connected with one of the keys to Alitalia's success before he even became associated with the company. He realized that the best way for the war-shattered Italian airline industry to get back into shape was to form a close association with carriers of the victorious nations.

As ambassador of Italy to the United Kingdom he played a large part in having the British government agree to British European Airways taking a large shareholding in Alitalia. This early link with the British is still paying off. Alitalia recently became the first continental European carrier to receive from the British government traffic rights between London and the United States.

Carandini's skill as a negotiator has been used time and time again by Alitalia to win new concessions from foreign airlines and governments. But his "wheeling and dealing" know-how proved particularly valuable when the Italian government decided to merge the two Italian airlines that survived the industry's postwar difficulties. There is little doubt that Carandini played a major role in having Alitalia come out top dog in this merger.

While Carandini is essentially the front man, the man who actually runs the airline is Bruno Velani, a hard-headed 30-year veteran of Italian airline operations. The 55-year-old executive keeps a tight control on all facets of Alitalia's activities. A rare combination of pilot, aeronautical engineer and businessman, Velani believes that orderly plan-



Above: the Italian carrier's far reaching air routes. Left: Count Nicolo Carandini, Alitalia's chief.

By ANTHONY VANDYK

ning is the key to success in the air transport industry.

For a small airline to buy a whole variety of aircraft and haphazardly open routes to all parts of the world is to court disaster, Alitalia's general manager feels. His policy is to extend the airline's operations gradually in pre-planned stages into various world traffic markets of interest.

The entire development program for the airline is carefully blueprinted by a planning department, headed by Piero Venturini, which has a position of special importance in the Alitalia chain of command. This department, which is mainly occupied with planning for developments five years hence, exudes optimism.

The reason for Alitalia's optimism about the future is primarily due to the company's success in the North American market. The New York route was one of the few real assets that Alitalia inherited from LAI. In 1958, the first full year after the absorption of LAI, Alitalia more than doubled the Italian share of transatlantic business. Under the energetic direction of Fabrizio Serena, its North American manager, Alitalia last winter increased the number of sales offices in the U.S. and Canada from five to 24.

Hike transatlantic service

Last summer Alitalia operated two roundtrips daily between the U.S. and Europe against 10 roundtrips weekly a year earlier. The most important feature of last summer's North Atlantic program was the introduction of London as an intermediate between Italy and the U.S. on certain flights. Alitalia also plans to serve Montreal via London whenever the Canadian government is prepared to change its present policy of refusing the Italian carrier traffic rights between the British capital and Canada.



While Alitalia's business in the North Atlantic is rising fast, the carrier continues to enjoy good traffic to and from South America, particularly on the Caracas-Europe route which it pioneered in 1948. On the Buenos Aires route Alitalia's traffic tends to be adversely affected by the unstable political and monetary situations in Brazil and Argentina. However, the fact that Italian transport aircraft have been flying the South Atlantic for two decades plus the large Italian migrant population in South America make Alitalia's situation much better than that of most of its competitors.

Built-in Italian traffic is also a feature of Alitalia's routes to North and East Africa where there are many Italian residents. The route to South Africa also shows satisfactory results, much of it destined for Israel.

The latest long-haul route opened by Alitalia links Rome nonstop with Karachi and then continues to Bombay. Coordinated schedules enable the company to offer a particularly fast through-service from New York to India with the minimum of stops. Within Europe it has shown improved loads since the introduction of 10 Viscounts originally ordered by LAI.

In the beginning: confusion

Many realistic Italian observers believe that Italy would have been better off if, like Germany and Japan, she had not been permitted to have an airline industry for several years after the war. Certainly, the immediate post-war years were not happy ones for the Italian airlines. With its industries devastated and a high proportion of its population out of work, Italy had many more urgent problems than that of putting its airline industry back on its feet. The result was that all sorts and types of companies came into being from 1946 onward with the intention of establishing air services. The two most important carriers were formed with substantial foreign capital—TWA had a 40% holding in Linee Aeree Italiane (LAI) while British European Airways held 40% of Alitalia's stock. By the early 'fifties these two airlines were the only survivors among the 10 or so companies which had tried to make a go of it.

Neither Alitalia nor LAI was in particularly good shape in the early 'fifties. Under the Italian government's policy of route allocations, direct competition was not permitted. However, this system had so many strange features that the two companies found that actually they were tending to

compete in certain areas. For example, both airlines were authorized to link Italy with Switzerland—Alitalia serving Geneva and LAI Zurich. For North America, the Italian government dreamed up an even more illogical arrangement: LAI was designated to serve the United States while Alitalia was given the right to serve Canada.

Under such conditions, it was hardly surprising that both companies found the going tough. It had been clear to observers for many years that the only real solution to the problems of the Italian airline industry was a merger. The government, which still continues the pre-war practice of controlling civil aviation through the Defense Ministry, took several years to see the advantages of such a consolidation.

Furthermore, the two individualistic airlines involved had very different ideas on how the merger should be accomplished. The fact that both Alitalia and LAI still had foreign stockholders (over the years TWA and BEA had somewhat reduced their holdings) did not facilitate matters. It was not until late 1957 that the merger was accomplished.

LAI was dissolved and its four Lockheed L-1649s on order were handed over to TWA as compensation for the U.S. carrier's stockholding. Most of the LAI top management did not remain with the merged company headed by the old Alitalia team of Carandini and Velani. The new company, named "Alitalia—Linee Aeree Italiane," is at present 88.75% owned by the Italian government through its IRI financial agency. BEA owns 6.75% while 4.50% is in the hands of Italian private enterprise.

4,100 paychecks

The merger agreement contained "security of employment" provisions for LAI personnel and consequently the integrated airline had the same number of employees as the two constituent companies. Thus, with the taking over of LAI, Alitalia increased its personnel from 1,000 to almost 3,500 and simultaneously moved into the red after several years of profitable operations. Personnel now total 4,100 and the management anticipates that the end of 1959 will see Alitalia back in the black.

Alitalia currently performs all its airframe maintenance at Ciampino (the progressive system is used for all aircraft except DC-3s), but engine overhaul is done by outside contractors. Fiat in Turin overhauls all the airline's piston engines (P&W R1830s, R2800s, and Wright 3350 Turbo Compounds) while Alfa Romeo in Naples has just started to handle Dart work. Previously Alitalia's Darts were flown by DC-3 to Rolls-Royce's plant in Derby, England. Plans for the overhaul of the Conways in the airline's DC-8s have not been finalized, but probably they will go back to Rolls-Royce initially.

With six DC-8s on order for 1960 delivery and a fleet of six DC-7Cs, eight DC-6Bs, three DC-6s, 13 DC-3s, six Convair 440s and 10 Viscounts, Alitalia is well equipped to take care of its immediate needs. But the management is also well aware that it requires some medium jets to meet the competition on its routes to South America, South Africa and India. And, for its shorter range services, Alitalia recently placed orders for eight Sud Aviation's Mark 3 Caravelles. Delivery of the first of the small twin-jet transports will begin in late May. The second Caravelle will be delivered in June and the third in July.

The Alitalia program to expand its operations is connected with the over-all Italian need to bring more tourists to Italy. In 1958, the Italian trade balance showed a deficit of \$351 million which was more than offset by "invisible exports" of \$380 million. Of these "invisible exports" the tourist industry provided \$329 million. In 1958, 15 million tourists visited Italy. The Italian government is shooting to double this figure as quickly as possible. In this program Alitalia has a vital role to play.

Pay Issue Bogs Down For Pilots In Britain



By DENIS FOLLOWES, M.B.E., B.A.,
Gen. Secy., British Air Line Pilots Assn.

THE MACHINERY for joint consultation and for settlement of differences in the air transport industry is the best there is in the U.K., yet labour problems are constantly disturbing the industry.

Why? First, while the machinery is good, the human element controlling it on the employer's side often falls down. Differences arising at local levels are apt to become magnified and progress to the national level because of the inability of management locally to give decisions. This is probably common to all nationalized industries where management tends to avoid decisions and prefers to "pass the buck" up the ladder of command or to an arbitration tribunal. Use of the arbitration tribunal seems to be considered as an effective alternative to negotiation.

Second, the industry itself is dynamic and problems often arise which have to be dealt with on an ad hoc basis. Past precedent, while helpful, does not always provide an answer. BALPA, like its counterpart in the U.S., now faces the problem of crew complement in the jets. The problem will most likely be resolved eventually by recourse to the constitutional machinery of the National Joint Council. The association has let it be known that the Boeing 707 will not be flown with a crew comprising fewer than three pilots. Carriage of an engineering officer on BOAC aircraft at this time presents no problem, if the Corporation wishes to carry an engineer, that is its prerogative.

BOAC to date has opposed BALPA's desire to carry three pilots. BALPA has proposed that the difference be referred to an independent tribunal whose decision should be accepted by both parties. Why? Because it does not want to be forced into a position whereby pressures are exerted upon it at the last minute in the Ministry of Labour to avoid a stoppage. If problems are tackled in good time, if real efforts are made to resolve them, and the available machinery is used without the introduction of delaying tactics, then stoppages should never occur.

The greatest source of friction over the years has been the introduction of summer and winter schedules, which in BEA have biannually produced disputes by the score and

almost biannual references to the industrial court. All until the winter of 1959 have been withdrawn at the last minute as the result of a patched up peace. Attempts have been made at a pattern of scheduling which becomes restrictive on one party or the other, but the problem persists.

There is no peace on the salary front. BEA promised a review of salary structure as of April 1958. None was forthcoming. In July 1958 BALPA produced proposals for an entirely new pay structure based on productivity. That was rejected in April 1959 and revised proposals were submitted by BALPA in June. At BOAC, management submitted a revised salary structure in December 1958. It was rejected by BALPA and counterproposals were submitted in February. Both of these issues are unresolved and progress has been bogged down in procedural disputes.

A claim for revised pensions for pilots was submitted in April 1957. Agreement was not reached until August 1959.

Negotiations on practically all terms and conditions of service for pilots with the independent airlines broke down in 1958. The employers flatly refused to submit the points in dispute to arbitration, an action that resulted in their being indicted on the National Joint Council for a breach of the constitution and their being forced to comply.

The pilots, not unnaturally, think all this is part of a deliberate plan on the part of employers to delay a final settlement; any delay, of course, being to their financial advantage as, in recent years, the practice of the arbitration tribunal has been not to back-date any of its awards.

It is clear from this brief outline of the problems facing BALPA that all is not well on the labour front. There is hardly an issue raised which is not a matter of dispute. There is a rigidity of approach to these issues, particularly by BEA, which makes discussion and negotiation extremely difficult. At times one gets the impression that the last thing that concerns BEA is getting a settlement.

This is all very disturbing because the last group of staff to be in constant dispute with management are the pilots. By virtue of their functions, at least insofar as they are captains of aircraft, they are part of management. No doubt higher management is concerned about this state of affairs, but so far only BOAC has seemed to have approached the answer to it, and BOAC, too, has slipped recently.

This problem of relationship between the pilots and management is not peculiar to the U.K. It is common throughout the world and is one deserving of the closest study by the warring factions. It might well be that a meeting between the two international groups of employers—the International Air Transport Assn. and the International Federation of Air Line Pilots Associations—would be productive of ideas for resolving the problem.

What BALPA Is

The British Air Line Pilots Assn. (BALPA), catering for all commercial pilots in the U.K., is a registered trade union affiliated to the British Trades Union Congress. Although BALPA prides itself on being a professional association, it is fundamentally a trade union.

BALPA was one of the founder members of Britain's National Joint Council for Civil Air Transport made up of nearly 20 unions catering for workers employed by airlines or ancillary groups. Said Peter G. Masfield, former chief executive of British European Airways, BALPA is the toughest union with which he had to deal. Over the years it has had more meetings of its sectional panel on the National Joint Council than any other trade group, probably has referred more differences to the conciliation officers of the Ministry of Labour and to the Industrial Court of Arbitration and used the NIC Appeals machinery more than other members.

SUNDYNE water injection pump built to operate 1500 hours between overhaul



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High reliability and long life result from the SUNDYNE principle which features negligible temperature rise during dry operation.

This pump is readily adaptable to meet the water injection requirements of all present day commercial jet engines.



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DECEMBER, 1959



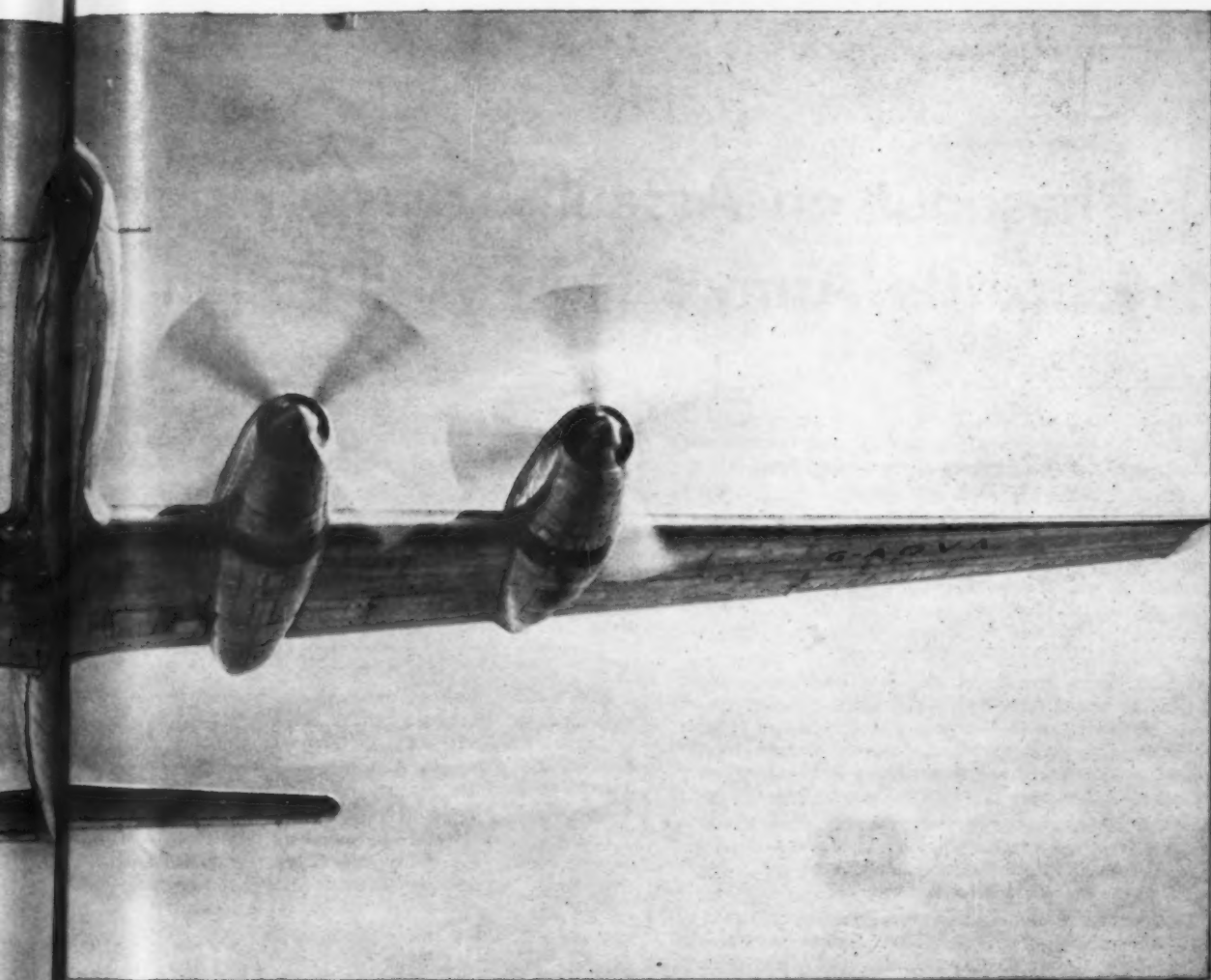
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One of the largest manufacturers of motive power units in the world, Bristol Siddeley Engines Limited produce the Proteus. A turboprop in the 4,000 hp class, the Proteus powers the Britannia airliner, in service with RAF Transport Command and ten airlines all over the world. The Proteus is perhaps the most dependable engine in the air today. It reached an overhaul period of 2,000 hours in under two years—a rate of increase never before achieved by any other engine, piston or gas turbine. Proteus derivatives have been designed for use as turbo-generator powerplants and as marine turbines.

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POWER FOR THIS

...AND THIS

...AND THIS



Two Bristol Siddeley Maybach diesels power this British Railways diesel hydraulic locomotive—develop a total of 2,200 hp. A large number of Maybach diesel engines have been ordered by British Railways alone.

The Bristol Siddeley Gamma rocket engine powers the Saunders-Roe Black Knight—Britain's highly successful space research vehicle. The Gamma, for a dry weight of only 700 lb, sends Black Knight 500 miles up into space.

The Bristol Siddeley Marine Proteus powers the world's fastest naval vessels, the "Brave" class Royal Navy patrol boats, built by Vosper Ltd. Three Proteus deliver a total of 10,500 hp—give these 96 ft boats a speed of over 50 knots.

AF Phaseout on Assault Transports May Scuttle Army's New Airlift Plan

A BIG "MISSING LINK" in military air mobility—how to move the Army's heavy and cumbersome Engineering Corps support equipment—has been found. But the new discovery may die on the vine for want of airlift capacity.

Here's the situation. In recent studies for the Army Engineering Corps, transportation consultants Albert E. Blomquist & Associates have come up with ways and means of airlifting all present-day Engineering support items, even such equipment as 58,200 lb. GarWood cranes and 34,510 lb. Caterpillar tractors.

The details on how to do the job have been worked out. An estimated \$200,000 modification program is all that is needed to make this vital phase of Army support completely air mobile. Training manuals on how to dismantle, load, unload and reassemble will be ready early next year. The project is ready to move.

But airlift capacity may prove a snag. For the first time, the Army knows what it needs to support its Strategic Army Corps (STRAC) but finds several of the aircraft needed to do the job are on the way out.

The key aircraft in the program are the Fairchild C-119 and C-123B and the Lockheed C-130. These would handle the air drop, assault landing and first follow-up support. Next are the Boeing C-97, Douglas C-124 and C-133 for phase III or major support operations.

But analysis by the consultants of USAF's phase-out plans for these types indicates the remaining 400 C-119s will become inactive this year. By 1964 the total USAF transport inventory will dwindle to 861 planes from 1,763 last year.

The study shows this program of phase-out:

	1959	1960	1961	1962	1963	1964
C-111	728	400	0	.....	.....	.....
C-123	425	420	400	200	0	.....
C-124	400	390	385	375	370	365
C-130	260	340	400	400	390	390
C-133*	35	60	88	100	96	94
Total	1,520	1,210	1,273	1,075	861	849

*(Ed. Note: USAF program calls for 50 C-133s instead of original 100).

For immediate relief, the consultants propose modification of 600 KC-97s to turboprops at \$800,000 per airplane or \$480 million over the next four years.

Another alternative, but more expensive, would call for increasing the production rate of the C-130 to maximum capacity (20 per month) but this would not produce the needed 2,000 aircraft until 1968. The cost would be \$6.5 billion at an annual rate of \$900,000.

Assuming adoption of one-half this program, retention of C-119s until 1964 and C-123s until 1966, plus some increase in C-133 output and development of a new STOL

(the C-127), here's how the consultants view the needs to adequately support STRAC and other airlift demands between now and 1967:

	1959	1960	1961	1962	1963	1964	1965	1966	1967
C-97	600	600	600	600	600	596	593	590	585
C-119	728	725	725	500	250	.....	.....	.....	.....
C-123	425	420	415	412	410	370	150	.....	.....
C-124	420	418	415	412	410	400	370	300	250
C-127	(STOL)	(STOL)	(STOL)	10	75	200	340	480	620
C-130	200	290	410	530	650	770	890	1,000	1,000
C-133	35	60	88	120	160	196	232	260	300
Total	2,408	2,513	2,653	2,584	2,555	2,532	2,575	2,630	2,755

Also as the result of the study, spearheaded by R. C. Navarin, asst. chief, mechanical equipment branch of the Engineer Research and Development Laboratory, Ft. Belvoir, the Army for the first time will have detailed instruction manuals for field use on step-by-step dismantling of field equipment for air mobility.

Looking toward future development of a modern transport to replace the C-119 and C-123, the consultants set down these general performance and design needs: Takeoff field length—1,500 ft. (over 50 ft. obstacle)

Payload—25,000 lbs. using 150 n. mi. radius
21,000 lbs. using 500 n. mi. radius
17,000 lbs. using 750 n. mi. radius

Cruise speed—net less than 160 knots

Cargo envelope—maximum dimensions of 280" long, 115" wide, 100" high

Ramp angles—20° for approach and departure, 140° angle of interference

Floor loading—uniform at 200 lbs./sq. ft.

Ramp ratings—good for axle load of 14,000 lbs.

Tiedowns—maximum use of 25,000 lb. and 10,000 lb. fittings

Floor height—Not to exceed 48" above ground

Footprint pressure—Not to exceed 40 lbs./sq. in. at max. grass weight.

Similar data developed for larger (Phase III and IV) aircraft revealed these requirements:

Takeoff field length—5,000 ft. over 50 ft. obstacle

Payload—65,000 lbs. for 500 n. mi. radius, 60,000 lbs. for 750 n. mi. and 50,000 lbs. for 2,500 n. mi.

Cargo envelope—max. dimensions 700" long, 144" wide, 150" high

Ramp angles—15° for approach and departure, 160° angle of interference

Integral winch—rated to load 50,000 lb. vehicle

Floor loading—200 lbs./sq. ft.; ramps rated for 20,000 lb. axle loads

Miscellaneous—Ramp load capacity 55,000 lbs.; use of 25,000 lb. tiedowns; floor height, 48" maximum; footprint pressure, 48 psi max.

G.E.'s Lift Fan

Farsighted air transport promoters long have eyed off again, on again VTOLs with more than casual interest.

One visionary supplier interested in VTOL engine development is

General Electric, whose

Cincinnati Flight Propulsion

Lab chief Dave Cochran, in an

exclusive AIRLIFT interview,

discloses . . .



D. COCHRAN

VTOLs Must Get Military Backing

• *Where does the U.S. aircraft industry stand today on VTOL transport development?*

Within the past 12 months virtually every major aircraft manufacturer has demonstrated increased interest in VTOL. Before that, they did not show real interest. Today some are working hot and heavy on VTOL; others are merely seeking data on potential propulsion systems.

• *What will it take to move VTOL development into actual hardware?*

What is needed now is a major effort. Unless VTOL gains the stature of a military weapon system, the time scale for development of a VTOL transport could be two or three times as long, assuming, of course, that the necessary funds could be found to finance a civilian or transport VTOL.

• *How much is needed to move VTOL development into high gear?*

Somewhere between \$100 million and \$200 million for propulsion system and airframe. Obviously, with a development price tag in this area, the "weapon system" type of funding becomes almost a necessity.

• *Are there sufficient military applications to justify such a program?*

Absolutely. There are any number of real applications

for VTOL. They extend from the very slow speeds to supersonic. In the moderate speed range, obviously are Army observation, close ground support, troop and supply mobility. Also there are missile base support and DEW line radar support. In the higher speed category the VTOL offers real potential for a fighter-bomber in the mach 2 range. Such an aircraft also would require a high speed military VTOL transport for support.

• *What about the commercial VTOL market?*

Here there are two big areas of potential. The first and probably the most needed area for VTOL performance is in city center to city center air transport. The second is the "family car," in one version—the combination of today's private auto and private plane, and in a larger model the equivalent of what we consider as today's business or executive aircraft.

• *What do you see as the development timetable?*

This, of course, depends on the scope of funding. Assuming the \$100 million to \$200 million were made available and we start to move right now, we could have a propulsion system qualified to fly in 2½ years. The complete airframe and engine could be developed and production aircraft flying in five years. In short, by 1964.

• *Where does GE stand on VTOL propulsion systems?*

We have studied extensively the various approaches such as tilt-wing turboprop, clustered turbojets with a cascade converter, wingless types using turbofan thrust support, etc. and favor an arrangement using a lift fan, diverter valve and conventional jet engine. For takeoff, hovering or landing the lift fan would convert high-energy, small mass flow of the jets into low energy, high mass flow. In cruise the lift fan would not be operating and the jet engine would power the VTOL transport at high subsonic speeds.

• *Is this development now being supported by military funds?*

Yes. Only three months ago the Army awarded GE a contract covering construction, test and analysis of such a lift fan propulsion system.

• *What about jet engines? Will VTOL require changes here?*

Only in the addition of such items as the diverter valve to direct the jet flow. Such present GE engines as the J85, T58 and T64 used as straight jets would cover the smaller thrust categories; the CJ805 the higher thrust regime, and I would look for an engine eventually in the mid-thrust range of about 6,000 to 8,000 lbs.

• *What do you see as the VTOL's contribution to air transportation?*

It will finally provide the answer to air service at ranges from 100 to 750 miles from city center to city center. Instead of 1½ hrs. at each end of the journey in travel to and from airports, we'd have as little as 15 min. Today the trip from Cincinnati to Chicago takes 4½ to 5 hrs. With VTOL matching current flight times, the journey could be cut to two hrs., or less than one-half of what it takes now. This is the big improvement to come in air transportation, one that is most needed and one that only the VTOL can provide.

I don't visualize their use as aircraft are operated today. The success would be in operating, say a 40-passenger VTOL, in the manner that commuter trains operate—on a convenient, closely scheduled basis, perhaps as often as every half hour, without requiring passengers to have advance reservations.

Third Quarter Jet Operating Costs

Turbine Aircraft Operating Costs and Statistics 3rd Quarter 1959 Domestic Operations

COSTS IN CENTS PER REVENUE MILE

COSTS IN CENTS PER REVENUE MILE																	
DOUGLAS DC-8				BOEING 707				LOCKHEED ELECTRA				CONVAIR 540		FAIRCHILD F-27			
DAL	UAL	AA	CAL	TWA	AA	BNF	EAL	NAL	NWA	WAL	AAA	BAL	PAC	PAI	WCA		
Crew Salaries and Expenses	44.0¢	22.7¢	17.9¢	24.4¢	26.0¢	20.0¢	26.7¢	35.5¢	21.7¢	18.7¢	18.7¢	18.5¢	.....	22.1¢	19.9¢	
Fuel, Oil, and Taxes	54.5	49.4	52.8	48.2	26.9	20.8	25.2	25.4	24.0	21.9	21.9	13.8	.....	18.4	17.4	
Insurance	42.2	23.3	15.2	14.6	7.3	5.0	2.8	7.2	3.3	N.A.	9.3	5.1	N.A.	6.3	5.9		
Other .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total Flying Operations	130.7	130.6	85.9	85.3	58.2	45.8	54.7	58.1	49.2	49.2	49.9	37.6	.....	46.8	43.2	
Labor	19.7	74.0	10.0	7.3	6.4	8.2	10.2	3.9	6.0	.....	3.3	6.7	.....	8.9	11.0
Materials and Outside Repairs	36.2	50.6	17.2	14.4	17.9	4.2	22.3	8.9	3.9	.....	19.1	11.6	.....	18.9	12.1
Reserves .....	.....	.....	4.2	18.8	26.5	20.6	2.4	1.9	.....	.....	.....	.....	.....	6.6	13.3
Total Direct Maintenance	55.9	124.6	31.4	40.5	50.8	33.0	34.9	14.7	9.9	.....	22.4	27.3	.....	34.4	36.4
Maintenance Indirect	27.9	148.5	21.9	8.4	11.7	13.9	10.9	5.7	7.2	.....	4.4	7.9	.....	10.4	7.5
Total Maintenance	83.8	273.1	53.3	48.9	62.5	52.0	45.8	20.4	17.1	.....	26.8	35.2	.....	44.8	43.9
Depreciation—																	
Aircraft	60.3	48.5	24.2	19.8	.....	18.2	26.5	25.4	24.0	.....	.....	5.6	.....	11.3	9.9
Engines	42.3	17.8	11.5	4.9	5.0	5.4	9.8	6.9	5.8	.....	.....	3.4	.....	3.4	3.3
Parts and Other	11.7	.....	3.8	3.0	2.9	4.2	11.3	4.5	7.4	.....	.....	4.7	.....	4.0	3.0
Total Depreciation	114.3	64.3	39.5	27.7	28.4	27.8	47.6	36.8	37.2	.....	26.0	13.7	.....	18.7	16.2
Aircraft and Engine Rentals .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total Aircraft Operating Expenses	328.8¢	470.0¢	184.1¢	143.0¢	215.9¢	137.0¢	148.1¢	115.3¢	103.5¢	.....	102.7¢	86.5¢	.....	110.3¢	103.3¢
Hours Flown—																	
Revenue	97	140	11,167	2,859	10,688	9,391	1,949	20,813	2,484	784	1,359	2041	2085	4492	3511		
Passenger	393	597	953	555	503	423	744	803	184	519	458	37	21	71	15		
Other	140	.....	54	42	63	74	26	47	3	.....	70	.....	.....	44	87
Total Hours Flown	490	877	12,156	3,456	11,254	9,886	2,241	21,940	2,917	1,316	501	2158	3095	4577	3465		
Revenue Utilization	6.04	4.30	4.52	9.19	8.22	5.33	6.10	6.31	7.14	5.33	6.02	5.34	5.24	6.06	6.22		
Average Fleet Size	2	42,643	5,220	1,317	4,976	3,117	658	4,776	863	273	109	547	616	843	675		
Revenue per Aircraft—First Class	39,520	62,457	81,376	52,339	81,376	52,339	47,781	37,781	40,311	59,122	109,244	49,740	616,581	843,740	675,830		
Passenger Load Factor—Coach	54.0%	80.5	91.4	71.1	92.1	73.9%	70.4	73.2	80.4	82.5	48.1%	53.2%	52.8%	47.0%	47.5%		
Average Seats Per Mile	118.0	104.2	111.4	114.4	111.2	48.3	45.0	49.0	74.3	44.0	21.2	35.7	34.0	16.9	18.5		
Average Passengers Per Mile	78.5	94.1	94.6	72.8	98.0	50.5	40.2	36.4	42.2	41.5	19.0	44.8	22.6	16.9	18.5		
Cost Per Seat Mile	2.79¢	4.35¢	1.45¢	1.42¢	1.94¢	2.01¢	1.67¢	2.15¢	1.52¢	1.34¢	2.33¢	2.42¢	N.A.	3.07¢	2.44¢		
Cost Per Passenger Mile	4.18	4.88	1.91	2.24	2.20	2.71	3.12	4.03	2.73	1.68	4.85	4.54	.....	6.53	5.58	
Average Flight Length—Miles	761	2,508	1,903	1,353	1,820	594	603	561	655	840	215	219	N.A.	91	101		
Average Speed—Airborne—mph	408	448	446	446	446	332	338	325	321	345	233	219	.....	192	192	
Average Speed—Block-to-Block	326	422	438	443	434	294	306	285	285	313	308	194	.....	177	162	
Fuel Consumed—Gals. Per Hour	1,585	2,392	2,150	2,320	2,072	752	723	740	717	692	360	235	N.A.	285	261		

Data from Airline Form 41 Reports to CAB.

Data from Airline Form 41 Reports to CAB.

Boeing 707 operators, during the third quarter, sliced their overall operating costs by 5% to 7% as American cut its figure from 194.89 to 184.1¢ per revenue mile and TWA from 230.77 to 215.9¢. Only Continental showed an increase over the 2nd quarter, rising from 134.81 to 163.0¢.

Utilization, meanwhile, increased 51 min. for AA

to 6:52 hrs., and more than two hours for TWA and CAL to 8:22 and 9:19 hrs. respectively.

In Electra operations, utilization continued at a low level, 5:33 hrs. for AA and 6:31 for Eastern, Western, however, managed 8:16 hrs. with a two-plane fleet for the period. Electra costs declined for AA from 169.89 to 137.0¢ but held relatively stable for EAL at 148.1¢.

First report on Allegheny Airlines' leased operation of an Eland-powered Convair showed seat-mile costs of 2.33¢ and total operating costs of 102.7¢ per revenue mile. In Fairchild F-27 operations, both Piedmont and West Coast improved utilization to 6:06 and 6:22 hrs. respectively. Bonanza, averaging 168 miles per trip, showed costs 15 to 20% below other F-27 users.

One bright day last month, Pacific Southwest Airlines loaded passengers into its first Electra, an act which marked the beginning of a new era for this bustling, intrastate carrier which sees an on-time record of 99.2% as something to be maintained, not shot at.



FRIEDKIN



WOOD

Hustling PSA Bucks Big Lines With Low Fares and Makes It Pay Off

By RICHARD VAN OSTEN

THERE'S NO SHORTAGE OF AIRLINE schedules or seats between Los Angeles and San Francisco. Nonstop service consists of 49 daily flights each way by United, Western and TWA. Equipment includes DC-6s, DC-7s, Connies, Electras, DC-8s and 707s. Similarly, there's no lack of service between San Diego and Los Angeles.

Yet in these markets, bucking this competition, is an intrastate operator, Pacific Southwest Airlines, that is doing quite well, thank you.

Against the modern equipment, PSA has been flying four DC-4s and hauled 296,000 passengers last year—and probably 320,000 this year (in 1949, its first year, PSA carried 15,000). Its on-schedule record has been as high as 99.2%. And now it's graduating from the 70-seat DC-4s to 92-place (plus six-seat lounge) Lockheed Electras. Service with the new plane opened last month, and in January PSA expects to have an all-Electra operation.

In carrying 296,000 passengers in 1958, the line grossed \$3.5 million and netted \$260,000 after taxes. Revenue and net are expected to gain 5% to 10% this year.

PSA's success, its officials say, is due to a combination of factors: fares that are less than its competitors' coach fares, keeping the number of stations served to an absolute minimum, no "city-hopping," and sharp scheduling.

Only four stops are served—San Diego, Los Angeles International Airport, Burbank's Lockheed Air Terminal, and San Francisco International. Los Angeles-San Francisco fare is \$11.81 plus tax, or about 3.5¢ a mile. Other airlines charge \$15.05 plus tax for coach, or 4.4¢. PSA's San Diego-Los Angeles fare is \$5.45 against the others' \$6.50, both plus tax.

PSA schedules about 106 flights per week, but may vary with holiday traffic to over 130. On last July 4 weekend, for example, more than 4,000 passengers were carried on Friday, Saturday and Sunday. Added flights are standard procedure each Friday night on most segments.

Says president and founder Kenneth G. Friedkin: "We try to fly when people want to go." Weekday flights are scheduled to suit the needs of businessmen. The convenient timetable and good performance have resulted in steady customers, and many of the crews and passengers call each other by their first names. Weekend schedules are set up according to trial-and-error experiences in passenger demands.

The big talk around the airline now is about the Electra. The three planes are being purchased by a Hilton enterprise, Electrahilt Inc., and PSA leases them with an option to buy. Friedkin states flatly: "We expect to own them at the end of three years." Engines are leased from Allison. Financing for a fourth Electra hasn't been disclosed, although the order is considered firm.

Despite the increase in available seats on the Electra over the DC-4, Friedkin and Hugh N. Wood, traffic and sales manager, are convinced load factor will remain near 70%. They maintain that a large portion of the car-using traffic along their routes will switch to the new service with its speed and economy. No fare increase is planned with the Electras, says PSA, advertising: "Luxury care at a reasonable fare."

An eyebrow-raiser was PSA's announcement of a 49-minute Electra schedule Los Angeles-San Francisco. Western's schedule is 1 hr. 5 mins. north, 1 hr. 7 mins. south.

The carrier has no plans for expansion to other routes. With the Electras in service, it wants to sell the DC-4s as a package, complete with spares and a temporary operating and maintenance crew, if required. Some negotiations are underway.

PSA has only one downtown ticket office, in San Francisco. At other points, business is handled at airport ticket

PSA's first Electra, which went into service last month.



counters. It claims that sales promotion efforts amount to only about one-tenth of those of the competitors. Principal push consists of occasional radio spots, signboards near airports, and some newspaper ads (all business forms, tickets and promotional material are printed on its own presses).

Often referred to as the "sport shirt airline," PSA picked up this name by its friendliness, and this, of course, has resulted in valuable word-of-mouth advertising. Said one observer: "This airline has a personality that rubs off on passengers." Incidentally, the company claims it has the "most beautiful hostesses on any airline."

PSA estimates that about 40% of its traffic is business travel. Weekday flights are used by many aircraft and missile engineers. On weekends, 30% of traffic is service-men traveling between San Diego and San Francisco.

Some 15% to 20% of total business comes from travel agents, who are paid a substantial 8% commission. A staff of salesmen concentrates on commercial firms, many of which maintain accounts with the carrier.

All PSA's major maintenance is done at San Diego, in the shops of Friedkin Aeronautics, its parent corporation (which also handles piston-engine overhaul for Aloha Airlines, Trans Mar del Cortes, and Las Vegas Hacienda Airways). A handy feature of intrastate operation is that PSA's aircraft are back at their home base every few hours. Electra maintenance is expected to be something more of a problem than the DC-4s, but only because the newer aircraft have more systems. The airline fully expects to exceed its DC-4 average utilization of eight hours per day.

Hauling Navy personnel put PSA into business in the spring of 1949. Friedkin had been operating a flight instruction school at Lindbergh Field, San Diego, handling the many ex-servicemen looking for instrument ratings and airline jobs. When business began to drop off, Friedkin sought other fields, and thought an airline might be a good

possibility. A DC-3 was leased to run San Diego-Oakland weekend flights.

Response to the first ad put 26 passengers on the 28-place plane. After two weeks, flights were scheduled every day but Tuesday, which was set aside for maintenance. After three months, the leased plane was returned and PSA bought its own DC-3s. When the school closed completely, Friedkin brought the staff into the airline, which is now a division of Friedkin Aeronautics Inc., a corporation owned by Mr. and Mrs. Friedkin and Mr. and Mrs. Vic Lundy. Lundy is a San Diego financier. As business grew, the DC-3s were sold and two DC-4s purchased, with two more added later.

Friedkin himself maintains a transport rating. His background includes a lot of wartime flight training, and he was with Convair from 1943 to 1945 as a production test pilot. Mrs. Jean Friedkin, corporate vice president, takes an active interest in operations, and has designed the Electra interiors.

Doug Kelley, another vice president, graduated from Army flying school in 1926 and is well known as an early flying boat pilot, former director of flight for Convair and the first pilot to land at Lindbergh Field. Secretary-treasurer is Eleanor Glithero, Friedkin's first secretary and a former Link instructor for the Navy.

Former students of Friedkin's include J. Floyd Andrews, assistant to the president; Hugh Wood; Leo Leonard, flight director, and Gordon Tinker, chief pilot (the latter two are also many-houred former military transport pilots). Jim Snyder and Homer Beckley, in maintenance, have been with PSA almost since the beginning. A recent addition to the pilot staff is the Friedkin's son, Tom, just out of the USAF.

The airline's optimism about the future is seen in the fact that, in reserving registration numbers for its Electras, PSA asked not for four, but for five.



When it comes to air cargo, Canadair is sparing no effort to push the market. And its swing-tail CL-44 is its big breadwinner.

MONTREAL—There's a big, new name to watch in air cargo. It's Canadair. Heretofore a relative unknown in the big commercial transport sales picture, the General Dynamics' subsidiary located here at Cartierville Airport has moved in on air cargo in a big way with its CL-44D swing-tail turboprop.

Not only has it notched the first sale in its history to a U.S. airline, but it sold a second almost simultaneously (first Seaboard and Western, then Flying Tigers) and has a third (Slick) in the fold with only trade-in terms to be resolved before the deal becomes final.

Air Cargo Gets Big, Big Backer In Canadair

By JOSEPH S. MURPHY

What's more, it holds an enviable sales position as the pressures to push air cargo mount. Its aircraft is ahead, schedule-wise. It's in production for an RCAF military contract. Although it hasn't yet landed the "king-size" order from a big U.S. or foreign airline, it holds contracts with Tigers for 10, five from S&W with five on option and the Slick deal adds two more with four on option.

The total: 17 sales, nine options, not counting the kickoff order for 12 non-swing-tail models for RCAF. The first of these completed its maiden flight two weeks ago and, together with the No. 2 RCAF airplane, will

FIRST AGAIN!



Air France—First European Airline to Fly Giant Boeing 707 Intercontinental Jets Across the Atlantic!

Here's another Air France "first" for the record! Soon Air France's Boeing 707 Intercontinental Jet will touch down at Orly Field after a 6½-hour non-stop flight from New York. This flight will mark the beginning of the world's first "jet-to-jet" service—intercontinental jets non-stop daily to Paris, Caravelle jets from Paris to all Europe, Africa and the Middle East.

Air France is no stranger to the pages of aviation

history. As early as 40 years ago, Lucien Bossoutrot made the first international commercial flight between France and England. Similar historic first flights include the first crossing of the South Atlantic, the Andes, and the first scheduled Far East service.

The inauguration of transatlantic jet service demonstrates the forward steps that have helped make Air France the world's largest airline, with the world's most personal jet service.

AIR FRANCE JET

WORLD'S FASTEST JETLINER / WORLD'S LARGEST AIRLINE

FIRST
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PRODUCTION!
FIRST
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DELIVERY!
ALL-NEW,
ALL-
CARGO
"FORTY
FOUR"



THERE ARE NO IFS, ANDS OR BUTS ABOUT THE CANADAIR FORTY FOUR. It is a "here and now" swing-tail cargo plane, at least 18 months ahead of comparable aircraft still in the "talking stage." The turbo-prop "Forty Four" is in full production for two leading American airlines and the military services of Canada. It has already been through the development stage and its Rolls-Royce Tyne engines have been thoroughly tested and proved. With the "Forty Four" in your fleet, you can be 18 months ahead of competition and in a most favorable earning position.



First photographs of the Canadair Forty Four, taken September 30, 1959 in Montreal. The "Forty Four" is now on the line for Seaboard and Western Airlines Inc., The Flying Tiger Lines and the Royal Canadian Air Force.

CANADAIR LIMITED, MONTREAL. CANADIAN SUBSIDIARY OF
GENERAL DYNAMICS CORPORATION



Boeing 735 can carry cargo for 3¢ a ton-mile



Photograph of scale model of Boeing 735

The Boeing 735 cargo jet, capable of transporting freight for as low as three cents a ton-mile, offers unparalleled opportunities for the development of world-wide air cargo potentials.

Based on the long-range, proved-in-service Boeing 707 Intercontinental, the new cargo jet will be capable of carrying 100,000 pounds of cargo across the U.S. in five hours. It will be powered by turbofan engines, providing increased take-off performance for short-field operations, as well as economy at high speed and long range. The new Boeing 735 cargo jet can be delivered in early 1962.

The swing-tail 735 is part of an advanced integrated terminal-to-terminal cargo system now under development by Boeing's Transport Division. The system includes ground transporters, special pallets, pre-loaded containers and other equipment designed to expedite loading, unloading and ground-handling operations.

Air-conditioned and pressurized cargo space totals 9,000 cubic feet. Range, with 100,000 pounds of cargo, is more than 3,000 miles. With a work rate four times that of current piston aircraft, the 735 could, in one week, carry as much cargo across the U.S. as a 40-car freight train.

BOEING 735 CARGO JET



REDPATH



LARSSON



McDONALD

rack up a good 75% of FAA certification testing before the first commercial number comes off the production line for Seaboard late in 1960.

One of Canadair's big blessings from RCAF was an agreement to accept civil certification of the CC-106, its tag for the CL-44. This permits a much shorter gap between first commercial rollout and final certification.

Another Canadair advantage on which it is pinning its sales pitch is engine experience. The Rolls-Royce Tyne 12 is far out ahead of any competitive engine as to schedule. Some 500 already have been built. Flight time will begin to accrue at a fast pace within the next few months in Vickers Vanguard operations and some 100,000 hrs. will be on record when the commercial CL-44D is ready to go. By that time, Tyne overhaul period will be at 1,000 hrs., perhaps even higher, judging from the pace set by the R-R Dart in teardown frequency.

Canadair not only has a ready airplane and a good schedule. It has a sales team geared to airline thinking. Peter Redpath, its highly regarded v.p. of sales, knows the airlines, was a pilot and chief navigator for TWA 10 years before World War II. He spent another year as assistant to TWA's board chairman before moving to the embryo SAS in 1946 as exec. v.p., a post he held until joining Canadair in 1950.

K. H. "Karl" Larsson, director of commercial sales, also holds valuable airline experience both with ABA Swedish Airlines and subsequently (1945-50) with SAS as chief engineer before coming to Canadair in '50. Only K. J. "Ken" McDonald, commercial sales manager, stems from military background, 21 years with the RCAF and RAF.

The Redpath-Larsson-McDonald trio is not only selling CL-44s, it is selling air cargo on a broader scheme. A good hint of their intent to "stay with the business" is the joint venture undertaken with Tigers to come up with a breakthrough tariff that will attract more tonnage to the air. Next year alone Canadair will underwrite with FTL research totaling \$200,000 including some top-drawer consulting services from Professors Stanley A. Brewer, Univ. of Washington, and Roger B. Ulvestad, U.C.L.A.

The goal is a tariff 30 to 40% under today's, as low as 6¢ a ton-mile for some commodities and an average 13 to 14¢ compared with the present 18 to 19¢. Heading this project for Canadair is manager-sales research Keith Miller who has been hard at work with R. L. Brunner, FTL's manager of rates and tariffs, since late in September.

Canadair's CL-44D, as it stands today, grosses 205,000 lbs., has a maximum landing weight of 165,000 and zero fuel weight of 155,000. Dimensions are: length—136' 7", span—112' 3" and height—36' 8". Its four Tyne 12s each are rated at 5,730 equivalent shaft horsepower.

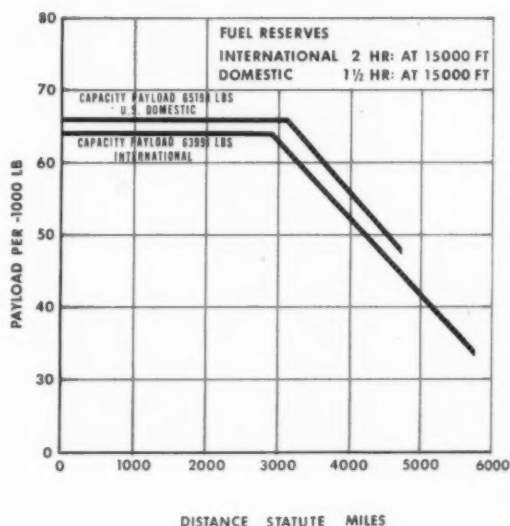
But in this day and age of juggling the specs to land another customer, don't be surprised if some of these numbers change. It's no longer a house secret that a CL-44D-5 is in the cards (present orders are for -4s) that would hike the payload from 63,991 to 76,785 while keeping the same 205,000 gross. Max. landing weight would increase from 165,000 to 175,000 lbs.

In the -5, basic operating weight drops from 91,000 to

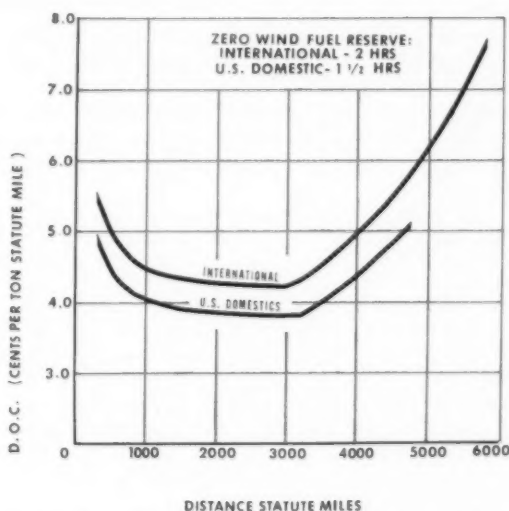
88,215 lbs. and total fuel from 81,200 to 68,410 lbs. Cruise speed would be 337 instead of 342 knots at 20,000 ft. SR-422A landing distance would increase slightly, from 6,780 to 7,075 ft.

Although the concept of the swing-tail on the "44" dates back only 10 months, the project actually is in its fifth year at Canadair. RCAF gave the go-ahead on the freighter early in '57 with Bristol Orions as powerplants. The switch to Tynes came in February 1958 and engineering was completed a year ago this month. To date, Canadair has expended 2.5 million engineering manhours on the CL-44 and its CC-106 military counterpart.

Despite its Bristol Britannia structural heritage, the "44" probably qualifies as the most American transport developed outside the U.S. For systems equipment, the roster of suppliers numbers 22 U.S. to 19 Canadian; outside production items, 27 to 23; raw materials, 25 to 24. Only in purchased hardware is the CL-44 procurement heavy with Canadian suppliers (five U.S., 11 Canada).



CL-44 payload/range curve reflects no need to trade payload for fuel up to range of about 3,000 miles in both domestic and international operations.



CL-44D direct operating cost plotted with these exceptions to ATA formula: Insurance—3%, utilization—4,000 hrs. and depreciation—10 yrs. to 10% residual.

The Rolls-Royce RB.141 by-pass engine, as well as derivatives (like the RB.163) which will follow, is calculated to operate with the highest compression ratio technically possible. How this ratio is determined is told by a Rolls engineer, who explains . . .

How Rolls Picks By-Pass Ratios

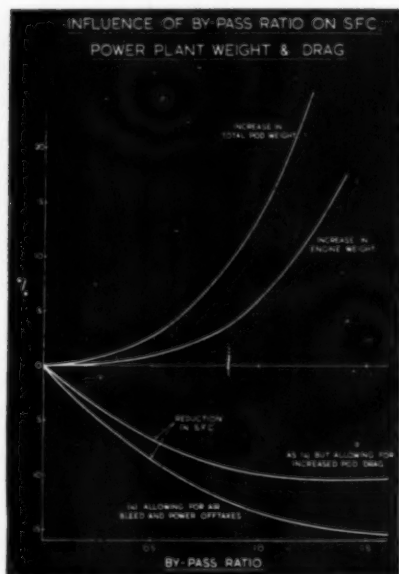


Fig. 1

THE AVIATION INDUSTRY has now recognized that the by-pass or turbofan jet engine is the best powerplant for high-speed supersonic transports. Rolls-Royce has been developing this type of engine for nearly 10 years and is now working on a new series of by-pass engines intended primarily for airline use.

This series comprises the RB.141 and its derivatives such as the RB.163, powerplant of the Airco DH 121, three-engine transport ordered by British European Airways.

Rolls-Royce's first by-pass engine was the Conway. Although this has been ordered by six airlines, the basic design represents a compromise between the requirements of civil and military operations.

The by-pass ratio (the ratio of air passing through the by-pass duct to that going through the combustion chambers) has to be fixed by such considerations as the maximum installed diameter and airflow permissible in the military installation. The Conway is, as a result, in the "low" by-pass ratio category which is not necessarily the optimum for commercial transport operation, although its performance is still superior to that of comparable straight jets.

Before starting on its new series of by-pass engines intended purely for airline use with optimum operating economics for short-to-medium ranges, Rolls-Royce carried out a comprehensive study of the best by-pass ratio to employ. The main factors involved in this study were:

1. Engine specific fuel consumption decreases with increasing by-pass ratio.
2. For a given engine operating temperature and a fixed

By H. PEARSON
Chief Research Engineer
Aero Engine Division
Rolls-Royce Ltd.

ENGINE + FUEL WEIGHT FOR 1000 N. MILE STAGE LENGTH

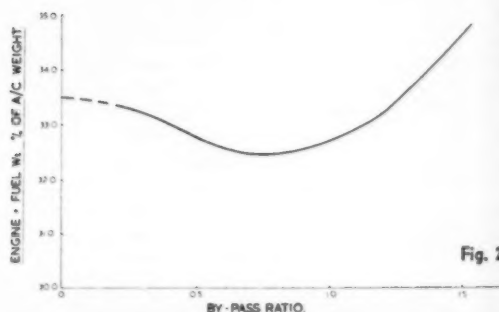


Fig. 2

ROLLS-ROYCE RB 141 BY-PASS ENGINE.

SEA LEVEL STANDARD DAY TAKE OFF.

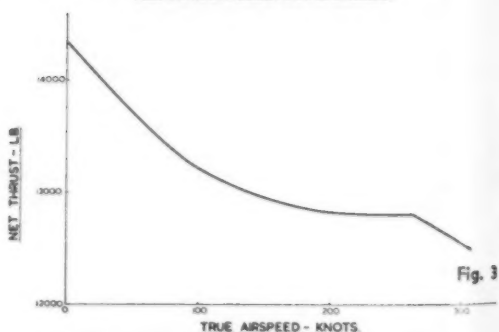


Fig. 3

ROLLS-ROYCE RB 141-3 BY-PASS ENGINE.

35000 FT 310 KNOTS TAS, STANDARD DAY.

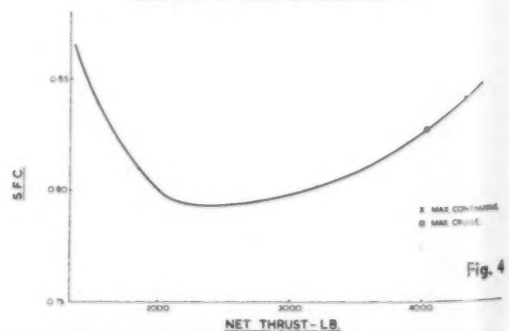


Fig. 4

cruise thrust, engine size increases as the by-pass ratio increases. Therefore engine weight, particularly installed weight, rises with increasing by-pass ratios. As engine size increases, there is also a penalty in the form of increased drag, especially when external pods are used.

3. Aircraft demands for airbleeds and auxiliary drives impose an increasing penalty in engine performance as the by-pass ratio is increased (Fig. 1).

The weight and drag penalties imposed by an engine of given by-pass ratio for a given aircraft size are roughly fixed. The aircraft performance gain, due to reduced fuel consumption, depends on the duration of flight.

There will be a stage length beyond which the gains from reduced specific fuel consumption will outweigh the penalties of drag and weight. Therefore it is clear that the best value of by-pass ratio depends on the stage length. However, as the penalties also depend markedly on altitude, and longer ranges tend to be associated with higher altitudes, the variation of optimum by-pass ratio with stage length is not as marked as might be supposed.

A typical result for the required engine-plus-fuel weight for an aircraft of fixed payload is plotted against the by-pass ratio. Fig. 2 shows that the optimum is 0.6 to 0.7.

An important characteristic of the by-pass engine is that noise level for a fixed engine temperature and thrust reduces with increasing by-pass ratio, and this has had a great influence in the direction of higher by-pass ratios.

Thus we arrive at the general inference that by-pass ratios should be about 0.7 or no higher than dictated by airport noise considerations. There is at present no economic advantage in being quieter than these requirements and if they dictate a ratio of 0.7 or higher losses are likely.

These factors led to the decision to design the RB.141 and its derivatives such as the RB.163 as "medium" ratio by-pass engines. For these engines, economic advantages are obtained by operating at the highest practicable compression ratio and temperature. For this reason the RB.141 has as high a compression ratio as is technically possible using two separate compressors on twin shafts. It also incorporates air-cooled turbine blades.

Extensive rig testing of components has already been carried out and the first engine went on test in October 1959. Production engines will be available in late 1961.

The engine design has gone through various phases in relation to the projects with which it has been associated. The initial commercial rating on the RB.141-3:14,340 lbs. thrust (13,980 lbs. guaranteed minimum) for take-off with an engine dry weight of 3,650 lbs. Fig. 3 shows takeoff thrust against forward speed and Fig. 4 shows altitude cruise thrust against specific fuel consumption.

For later delivery a higher rated and further developed engine is available with a takeoff thrust of 15,350 lbs. (15,000 lbs. guaranteed minimum), and future developments of the engine are expected to achieve 18,000 lbs.

Thrifty advice on jet maintenance:

Put That Standby Jet Back In Service!



Among top contributors to ATA program were (left to right) R. M. Adams, Pan Am, Clark Fisher, TWA and H. J. Heinrich, TCA. At far right, J. R. Horton, Braniff, named meeting chairman for 1960.

NEW ORLEANS—The turbines are taking over in airline engineering and maintenance and the effects, at first glance, are good. For one, they already have served to snap the annual Air Transport Assn's Annual Engineering and Maintenance Conference out of its lethargy of recent years and transform it into a meaty and meaningful session.

This trend was strongly in evidence as the technical brains of 24 U.S. and Canadian airlines convened here to get a first hand report from the three big jet operators—Pan Am, TWA and American.

Here's what they learned about jet maintenance to date:

Jet Costs: Pan American's Atlantic Division maintenance manager R. M. "Dick" Adams pegged first year maintenance costs at about \$290 per flight hour compared to \$120 for the DC-7C and \$70 for the DC-6B. But when these costs are related to capacity and speed, the 707 comes out ahead with a maintenance cost of 3.2¢ per available ton-mile, the DC-7C 3.3¢ and DC-6B 3.25¢.

Delays: In schedule performance (see charts) 707 delays due to maintenance run about 8% compared to 5% for both the DC-6B and Boeing 377 and 3% for the DC-7C.

Turnaround Maintenance: For turnaround transit service

at terminals, the 707 requires about 80 manhours, about double the DC-7C, and five elapsed hours. Surprisingly, the expected radical change in the distribution of airframe, engine, electronic work just isn't there. The breakdown closely resembles past piston experience (see charts).

Terminal Service: A 60-hour terminal jet service calls for some 280 manhours and 16 elapsed hours compared with about 120 manhours and nine elapsed hours for DC-7Cs. Routine manhours run about double the DC-7C, but the non-routine are higher, by about 2½ times.

200 Hour Checks: Pan Am's experience here is distorted by the fact that 2,500 hr. equalized overhaul was split up among the 200 hr. inspections to avoid having its initial fleet of six 707s tied up in overhaul all at once. Adams figures that the 200-hr. check, without this work, would run about 1,080 manhours instead of the 1,260 experienced, or about double the DC-7C. If the engine "hot section" inspection (400 hrs.) were added in, 707 manhours would be triple the DC-7C. Elapsed time runs about 37 hrs. against 24 for the DC-7C.

JT3 Performance: The P&W JT3 jet as a basic engine is out-doing the best of piston types, but its accessory

gear is giving sufficient trouble to bring premature removal rates about equal to best piston experience, according to TWA's director of aircraft engineering, Clark Fisher. Removals run about 0.16 per 1,000 engine hours for both, whereas the poorest piston record was about 0.6.

Delay Causes: Fisher tabulated these powerplant sources of 707 flight delays: water injection system-82 delays (usually involving return to gate and 1.5 to 3 hr. delay); starting-50 delays; fuel system-23 delays; generator constant-speed drive-22 delays; fire-warning (all false)-18 delays; oil system-15 delays. In all, TWA experienced about 250 such delays in the first 60,000 engine hours (15,000 707 hrs.) of operation.

Jet Overhaul: J. F. "Joe" Martin, manager of American's turbine overhaul, said the JT3 is outperforming AA's estimates as to premature removal rates with a figure of 0.39 per 1000 engine hours compared with 1.5 forecast for 1959. And instead of failures averaging 200 hrs., the actual figure is between 700 and 800 hrs. In fact, for want of a failed engine, American had to run a new JT3 through its shop on the pilot run of the facility.

AA estimated JT3 tooling and equipment at \$1.25 million, actually spent about \$970,000. Here's how the carrier's estimates of engine overhaul manhours panned out:

	Est. Man-hours	Actual (% Variation)
Dismount	16	+ 44
Disassembly	46	+ 4
Parts Serialization	0	+100
Cleaning	25	+190
Inspection	121	+ 86
Subassembly	73	+ 50
Final Assembly	38	+210
Test Cells	18	+ 80
Bearings/Seals	26	- 11
Rotor Rework/Assembly	208	- 60
General Rework	80	+ 25
Total	651	

Martin said AA has found the JT3 an easy engine to run in the test cell. It is installed and hooked up in six manhours (2.5 hrs. elapsed), 1.5 to 2 hrs. actual run time, and removed and given a final check in nine manhours (3 hrs. elapsed).

Jet Planning: Biggest eye-opener at the ATA session was Trans-Canada's planning superintendent, Heinz Heinrich, with a challenge to maintenance officials on jet economics.

His observation: airlines pay \$6 million for a new jet, then plan a maintenance system that needs a spare plane. Cost: \$1 million a year in depreciation and insurance.

A single jet will generate revenue at \$3,000 per hour at 70% load factor. This means \$25,000 a day at 8 to 9 hrs. utility. But with a profit of roughly \$2,000 an hour, why not aim for utilization of 12 hrs. or more?

Take a fleet of 10 jets. A 1% hike in load factor would equal an 18% reduction in direct maintenance costs. One additional jet in service means annual earning of \$7.5 million before overhead. For a fleet of 10, this is equivalent to increasing utilization from eight to nine hours.

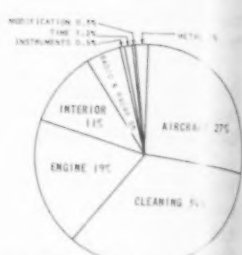
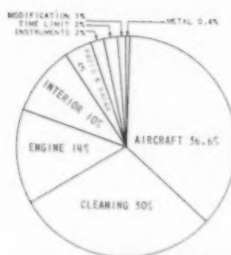
What about inventory, asks Heinrich? Maintenance labor will run about 5% of total direct costs whereas materials will be at least triple that figure. Should not airlines switch their prime effort from management of man-power to management of inventory?

As a partial answer to these big questions, Heinrich told ATA that TCA will launch jet operations without a major (2500 hr.) type check on its DC-8s. Work will be scheduled at 9-hour layovers at Montreal on 200-hr. checks, thereby releasing one DC-8 for service at a saving of about \$1 million a year in ownership cost.

TURNAROUND TRANSIT SERVICE

Manhours 707
Elapsed Time (Hrs.) 80

DC-7
40
4



TERMINAL SERVICE

Manhours 707
Elapsed Time (Hrs.) 280

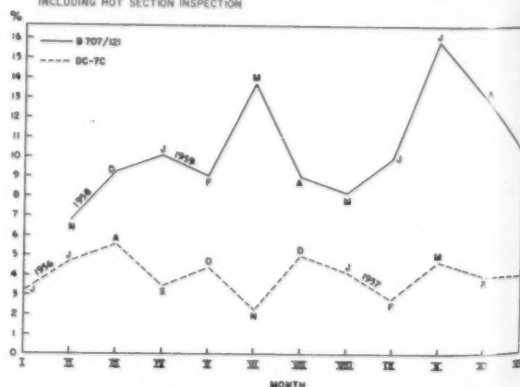
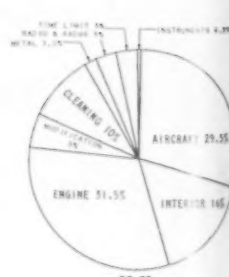
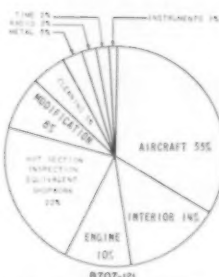
DC-7
120
9



EQUALIZED CHECK

Manhours 707
Elapsed Time (Hrs.) 1,625

DC-7
500
24



Comparison of 707 and DC-7C departure delays indicating percentage due to maintenance by month for the first year of operation. During '59, 707 ran 8% and the DC-7C about 5%.



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DC-8

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Cash Dividends Near Record in '59

**Survey pegs total at \$19.7 million,
second only to \$20.1 million peak
of record-breaking '56**

By SELIG ALTSCHUL

Cash dividends to be paid by the domestic trunk airlines during 1959, while moderate, are likely to be the second highest in the group's history and about 18% above the average of the past eight years.

An exclusive survey estimates total cash disbursements to trunk carrier stockholders at \$19.7 million, slightly below the \$20.1 million peak established in 1956 and comparing with an eight-year average of \$16.2 million (Table 1).

It is too early to estimate 1959 final earnings. Year-end adjustments, particularly on items concerning training

costs and jet integration expenses, will vitally influence reported net earnings. Strikes in late 1958 and early 1959 also distort comparative trends.

Assuming, however, that final 1959 trunk airline earnings, as reported, may be around \$40 million, cash dividend disbursements will represent a payout of about 49%, comparing with the previous eight-year average of 33%.

Actually, the 1959 percentage payout (as well as 1957) was boosted disproportionately in the face of lower earnings. A number of major carriers were determined to maintain previously established dividend rates.

Frequently, it is sound corporate policy to make consistent, regular cash dividends even in the face of heavy capital outlays. This develops investor confidence and instills an atmosphere of stability which ultimately may serve to attract capital on more favorable terms.

Despite the airlines' relative high payout in 1959, they were well below the U.S. corporate average. For example, in 1958, U.S. corporate experience showed a dividend payout of 65.6% and an eight-year average of 53.8%.

In this exclusive dividend survey, Table 2 shows the cash dividend record of the trunk airlines and Pan American World Airways for 1959 with comparisons for 1958, 1957, 1955 and 1953.

In a number of instances, cash dividend policies appear to be stabilizing, primarily through regular quarterly payments.

For example, American Airlines, at a \$1.00 per share payment on its common stock, will have disbursed about \$8.2 million to its common stockholders during 1959. With cash payments of almost \$400,000 to its preferred shareholders, American, in the aggregate, will account for almost 44% of the cash dividend payments of the domestic trunks.

The airline industry has also increased its use of stock dividends. In this manner, cash is conserved while a form of distribution is made to stockholders.

Many stockholders, in fact, prefer this form of dividend since it is not subject to Federal income tax and is an effective means of building up equity. Stock dividends used in this manner, of course, increase the outstanding share capitalization and require management to show earnings on these added shares.

United Air Lines, for example, utilized a 7% stock dividend in 1957 to compensate for a reduction of cash

TABLE 1—Comparative Dividend Disbursements

	U.S. Corporate Average			Domestic Trunks		
	Net Profit After Taxes	Dividends (Billions)	% Div. Payout	Net Profit After Taxes	Dividends (Millions)	% Div. Payout
1951	\$19.7	\$ 9.0	45.7%	\$43.5	\$12.5	28.7%
1952	17.2	9.0	52.3	53.5	12.7	23.7
1953	18.1	9.2	50.9	48.4	13.0	26.9
1954	16.8	9.8	58.3	51.5	15.0	29.1
1955	23.0	11.2	48.7	63.1	18.8	29.8
1956	23.5	12.1	51.5	57.7	20.1	35.0
1957	22.2	12.5	56.3	27.0	18.9	70.0
1958	18.9	12.4	65.6	44.4	18.7	42.1
Av.						
1951-1958	19.9	10.7	53.8	48.6	16.2	33.3

Sources: Department of Commerce, Survey of Current Business; airline company reports.

TABLE 2—AIRLINE CASH DIVIDENDS (Per Common Share)

	1959*	1958	1957	1955	1953
American	\$1.00	\$1.00	\$1.00	\$1.00	\$0.50
Braniff	0.60	0.60	0.60	0.60	Nil
Capital	Nil	Nil	Nil (5)	Nil	Nil
Continental	Nil	Nil	Nil (5)	0.50	0.50
Delta	1.20	0.60	1.20	1.00	0.90
Eastern	1.00 (1)	1.00 (1)	1.00 (1)	1.00	0.50
National	0.12½ (2)	Nil (2)	1.00	0.60	0.50
Northeast	Nil	Nil	Nil	Nil	Nil
Northwest	0.80	0.80	0.80	0.60	Nil
Pan American	0.80	0.80	0.80	0.80	0.65
TWA	Nil	Nil	Nil	Nil	Nil
United	0.50 (3)	0.50 (3)	0.50 (3)	1.50	1.50
Western	0.85 (4)	0.80 (4)	0.80 (4)	0.90	0.60

* Estimated (1) Plus 2% in stock (2) Plus 9% in stock in 1959, 12½% in stock in 1958 (3) Plus 6% in stock in 1959, 1958 and 7% in stock in 1957 (4) Plus 4% in stock (5) Paid 5% in stock.

dividend payments which reached \$1.50 per share in 1956. Annual dividends of 6% were declared in 1958 and 1959.

Eastern, a low cash dividend payer, supplemented its established \$1.00 per share cash payment with annual 2% stock dividends in 1957. National, after omitting cash dividends in 1958, gave its stockholders dividends of 12½% in 1958 and 9% in 1959.

Western has shown an aggressive disbursement policy. When dropping to a cash dividend of 20 cents quarterly in 1956 (after paying a slightly higher rate), the company supplemented cash with 4% in stock. This stock dividend has been maintained at the same rate ever since. In addition, for the final quarter of this year, Western declared a cash dividend of 25 cents per share, placing the stock on a \$1.00 cash basis as compared with the previously indicated annual cash rate of \$0.80 per share.

As the airlines have built up equipment fleets, their capital structures have also increased sharply. Debts in the form of short and long-term loans have shot up much faster than equity positions. One consequence has been heavy prior charges in the form of interest payments.

Domestic Load Factor Dips

Indication of things to come may be seen in the October traffic report for the U.S. domestic trunklines (see chart).

Passenger miles of 2.38 billion were 13.3% over the same month in 1958, but available seat-miles took a big 14.9% jump to 4.01 billion. As a result, load factor dropped from 60.22% last year to 59.35%.

ON TIME PERFORMANCE—SEPTEMBER, 1959

LOCAL SERVICE	Rank	On time to 15 min. late		On time to 5 min. late	6-15 min. late	16-30 min. late	Over 30 min. late	Total trips reported
		August	Sept.					
Allegheny	10	63.0%	67.3%	41.6%	25.7%	12.1%	20.6%	257
Bonanza	5	76.2	84.2	75.1	9.1	8.5	7.3	328
Central	7	72.8	73.8	47.8	25.0	11.3	15.9	44
Frontier	9	87.0	72.3	51.7	20.6	10.1	17.6	266
Lake Central	4	84.6	87.1	60.4	26.7	8.9	4.0	225
Mohawk	11	58.8	64.2	38.0	26.2	19.0	16.8	1124
North Central	6	N.A.	79.5	53.0	26.5	14.6	5.9	151
Ozark		63.1	Not Available					
Pacific	8	79.4	73.7	49.4	24.3	10.8	15.5	193
Piedmont	1	80.7	97.8	93.3	4.5		2.2	44
Southern	12	67.8	60.7	28.1	32.6	24.0	15.3	497
Trans Texas	3	71.8	87.6	43.3	44.3	10.5	1.9	210
West Coast	2	96.2	91.2	85.7	5.5	3.3	5.5	90

All statistics reflect nonstop and one-stop flights only. Data from airline reports to CAB.

Airline "on-time" analysis for September regrettably must be confined to the activities of the local airlines as a result of unavailability of most trunkline data for analysis at deadline. However, AIRLIFT will consolidate September and October trunk performance in its January edition.

Among the locals, Piedmont garnered

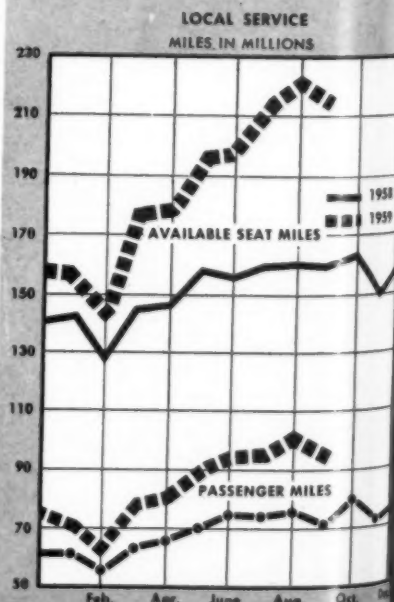
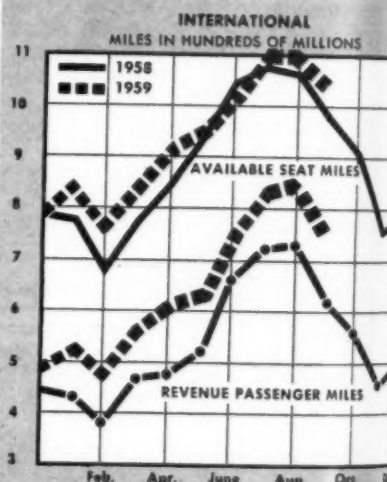
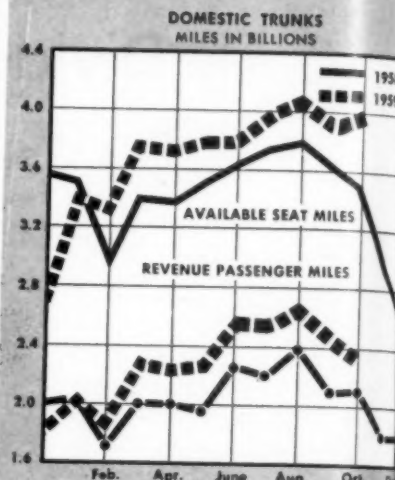
For example, on a debt of \$35 million, Delta has an annual interest cost of \$2.5 million (before taxes) as compared with the \$1.4 million in dividends which were paid to stockholders during the calendar year 1959. Pan American, with a debt of about \$215 million, is obligated to disburse some \$8.5 million in interest annually. This compares with about \$6.6 million in cash dividends this year. Northwest, on a debt of \$40 million, is faced with an annual interest obligation of \$2.4 million, more than double the \$1.1 million paid to common stockholders in 1959.

Prior charges on debts and rentals due on various leaseholds will make a significant increase in dividends unlikely for airline stockholders. Loan agreements contain provisions which prohibit cash dividend payouts unless certain tests are met.

Despite the self-generation of funds through depreciation cash throwoffs, the airline industry has an almost insatiable appetite for funds to pay for planned expansion in aircraft and related facilities. While management generally would like to be more liberal in paying cash dividends, the bulk of future earnings can best be used to bolster capital.

Seat-miles showed the highest comparative monthly increase since December 1957 and the drop in load factors was the first in 13 months, when compared to the same month a year earlier. Outlook: as carriers add turbine-powered seat miles, load factors will sag further, despite the fact that the new equipment is attracting new business.

HOW'S TRAFFIC Among U.S. Airlines



U.S. Airline Traffic for September 1959 vs. 1958

This complete summary compiled by AIRLIFT Magazine from Official CAB data.

	Revenue Passengers (000)			Revenue Passenger Miles (000)			Total Ton-Miles Rev. Traffic			% Available Ton-Miles Used	
	1959	1958	% Change	1959	1958	% Change	1959	1958	% Change	1959	1958
DOMESTIC											
American	725	630	15.1	543,777	432,140	25.8	45,021,725	53,357,254	21.9	64.1	58.9
Braniff	179	174	2.9	79,544	75,387	5.5	8,800,137	8,289,456	6.2	48.6	49.0
Capital	343	334	2.1	139,058	135,124	2.9	14,619,810	14,179,427	3.1	55.2	49.5
Continental	107	75	42.7	71,264	38,389	85.6	7,353,299	4,014,653	83.2	42.9	40.5
Delta	248	217	14.3	121,006	101,847	18.8	13,790,608	11,568,747	19.2	51.5	51.1
Eastern	708	601	17.8	363,474	302,496	20.2	38,139,402	31,871,260	19.7	40.4	42.9
National	130	99	31.3	72,919	54,573	33.6	7,926,531	6,024,192	31.6	41.1	39.4
Northwest	111	72	54.2	38,362	23,118	65.9	3,926,953	2,392,467	64.1	37.5	29.6
Trans World	165	142	16.2	127,493	104,808	21.8	14,534,599	11,831,622	22.8	53.2	50.7
United	476	392	21.4	444,944	337,712	31.8	47,628,985	36,445,859	30.7	64.4	58.6
Western	626	599	4.5	431,466	447,205	-3.5	51,466,410	53,375,357	-3.6	45.0	57.3
	154	113	36.3	85,638	60,270	42.1	8,924,085	6,429,172	38.8	52.4	41.4
	3,972	3,450	15.1	2,519,145	2,113,089	19.2	282,132,544	239,779,468	17.7	55.2	52.1
INTERNATIONAL											
American	9	10	-10.0	9,140	9,534	-4.1	1,143,935	1,249,029	-8.4	62.3	52.9
Braniff	4	4	...	8,165	6,940	17.7	1,005,345	887,830	13.2	50.2	43.7
Delta	4	4	...	5,523	5,493	0.6	653,425	657,311	-0.6	47.2	45.7
Eastern, Overseas	39	30	30.0	40,674	43,230	40.4	4,425,758	4,624,355	39.0	66.7	51.9
San Juan	31	23	34.8	51,142	35,032	46.0	5,372,438	3,756,473	43.0	72.8	55.5
Bermuda	4	4	...	3,053	3,022	1.0	318,912	319,235	-0.1	42.1	42.6
Mexico	4	3	33.3	6,479	5,176	25.2	734,408	548,647	33.8	49.2	39.6
National	6	8	-25.0	4,304	5,656	-23.9	526,939	661,017	-20.3	46.0	52.1
Northwest	18	14	28.6	32,444	28,842	12.5	5,620,858	5,260,345	6.9	58.3	71.1
Hawaiian	2	2	...	6,083	3,975	53.0	675,165	458,995	47.1	51.6	40.4
Panagra	12	11	9.1	17,558	12,955	35.5	2,454,099	1,899,443	29.2	65.9	54.1
Pan American, System	272	239	13.8	444,678	369,405	20.4	58,510,153	49,557,641	18.1	69.1	64.3
Latin American	104	87	19.5	122,761	96,641	27.0	16,726,040	12,576,060	23.2	67.3	63.7
Atlantic	133	126	5.6	191,443	183,565	4.4	24,597,549	23,213,995	6.0	67.9	65.1
Pacific	30	22	36.4	125,182	84,791	47.4	16,427,633	12,119,356	35.5	73.7	73.6
PDX/SEA-HON.	2	1	100.0	4,658	2,591	79.8	532,438	318,575	67.1	55.3	42.0
Alaska	5	4	25.0	5,092	4,408	15.5	758,267	648,230	17.0	59.0	51.5
Trans Caribbean	8	6	33.3	12,217	13,182	-7.3	1,364,041	1,297,590	5.1	79.1	80.6
Trans World	42	34	23.5	130,015	101,007	28.7	16,332,789	12,207,196	33.7	69.8	61.4
United	11	9	22.2	26,822	22,200	20.8	2,951,891	2,509,215	17.4	71.9	59.8
Western	5	2	150.0	7,811	2,503	212.1	844,982	275,626	206.6	72.2	47.3
	430	371	15.9	759,351	620,947	22.3	97,834,215	81,086,598	20.7	67.7	63.4
LOCAL SERVICE											
Allegheny	55	43	27.9	9,593	7,429	29.1	989,073	773,131	27.9	47.3	47.1
Bonanza	19	14	35.7	4,630	3,138	47.5	461,009	317,965	45.0	44.5	39.7
Central	14	12	16.7	2,679	2,384	12.3	281,873	250,929	12.3	34.0	31.5
Frontier	28	20	40.0	7,239	4,636	56.1	810,487	536,511	51.1	41.0	54.1
Lake Central	21	16	31.3	3,357	2,412	39.2	347,690	253,872	37.0	46.8	40.6
Mohawk	50	39	28.2	9,853	7,439	32.5	991,718	752,036	31.9	54.2	51.5
North Central	88	68	29.4	15,806	11,560	36.7	1,670,166	1,177,673	41.8	48.8	49.0
Ozark	51	38	34.2	8,917	6,453	38.2	935,928	672,330	39.2	49.7	50.7
Pacific	43	32	34.4	9,847	7,030	40.0	966,112	695,241	38.9	54.0	48.1
Piedmont	43	35	22.9	9,114	6,970	30.8	924,628	713,502	29.6	49.6	50.2
Southern	20	18	11.1	3,589	3,220	11.5	379,998	338,441	12.1	39.5	37.6
Trans-Texas	26	20	30.0	6,138	4,562	34.5	662,491	483,611	37.0	38.9	39.1
West Coast	33	21	57.1	7,683	3,975	93.3	768,438	403,752	90.3	43.5	47.6
	491	376	30.6	98,445	71,210	38.2	10,188,911	7,368,994	38.3	46.5	46.4
HELICOPTERS											
Chicago	23	11	109.1	414	215	92.6	40,689	21,875	86.0	50.2	28.3
Los Angeles	4	3	33.3	144	104	38.5	20,603	16,231	26.9	68.2	59.5
New York	12	10	20.0	218	187	16.6	23,380	20,929	11.7	53.1	47.1
	39	24	62.5	776	506	53.4	84,672	59,035	43.4	54.5	39.6
TERRITORIAL											
Caribbean	28	17	64.7	1,939	1,156	67.7	210,355	125,204	68.0	73.0	59.3
Hawaiian	37	32	15.6	5,389	12,105	-55.5	578,797	1,273,397	-54.5	56.5	74.7
Trans Pacific	27	15	80.0	3,932	2,167	81.4	323,577	182,235	77.6	55.8	52.2
	92	64	43.8	11,260	15,428	-27.0	1,112,729	1,580,836	-29.6	58.8	69.8
ALASKA											
Alaska	10	7	42.9	8,600	3,970	116.6	1,313,529	723,866	81.5	61.8	47.2
Alaska Coastal	5	5	...	579	399	45.1	67,122	49,154	36.5	62.5	64.2
Cordova	1	1	...	241	173	39.3	70,542	52,427	34.6	45.0	51.4
Ellis	6	6	...	375	319	17.6	42,394	36,784	15.3	60.1	48.9
Nor. Consolidated	3	2	50.0	906	702	29.1	197,821	184,028	7.5	63.4	67.0
Pacific Northern	11	10	10.0	10,561	9,578	10.3	1,585,333	1,461,961	8.4	59.5	65.3
Reeve	2	1	100.0	1,224	1,014	20.7	269,456	248,861	8.3	63.0	64.7
Wien	4	4	...	1,131	1,268	-10.8	331,838	340,222	-2.5	50.2	48.2
	42	36	16.7	23,617	17,423	35.5	3,878,035	3,097,303	25.2	59.4	57.7
ALL CARGO											
(Ton Miles in Thousands)	Mail			Express			Freight			Total All Services	
	1959	1958	% Change	1959	1958	% Change	1959	1958	% Change	1959	1958
Aaxico	5,348	5,348	...	10,957	10,957	...	388,485	388,485	...	4,070,630	3,305,602
Flying Tiger	42,275	35,811	18.1	103,710	33,787	206.9	8,364,223	1,200,130	34.9	13,327,566	10,668,860
Riddle	8,791	20,941	-58.0	29,068	33,499	-13.2	1,864,506	2,135,639	-12.7	1,902,365	2,190,079
Slick (charter)	...	...	...	...	...	...	482,601	578,160	...	5,758,247	598,625
Aerovias Sud	...	...	...	...	...	...	...	...	...	565,637	647,203
Seaboard	...	...	...	...	...	...	...	...	...	...	...
& Western	401,105	149,871	167.6	...	...	...	2,387,388	1,381,795	72.8	2,788,493	1,531,666
	452,171	211,971	113.3	132,778	78,243	69.7	13,098,718	10,684,209	22.6	13,683,667	10,974,423

Local Service Correction for August (Southern Airways): 1959 Revenue Passengers, 17; 1959 Rev. Passenger Miles, 3,049; 1959 Total Ton-Miles Rev. Traffic, 323,549.

U.S. Airline Revenues and Expenses

3rd Quarter 1959 vs. 1958

This complete summary compiled by AIRLIFT magazine from Official CAB Records

	Total Operating Revenues			Passenger Revenues			Total Operating Expenses			Net Operating Income					
	1959	1958	% Change	1959	1958	% Change	1959	1958	% Change	1959	1958	% Change			
DOMESTIC															
American	\$105,430,723	\$83,121,389	26.8	\$95,084,673	\$73,281,983	29.8	\$90,959,692	\$72,917,506	24.7	\$14,471,031	\$10,203,883	41.8			
Brantiff	16,171,529	15,058,490	7.4	14,659,997	13,674,979	7.2	15,427,981	13,670,773	12.9	743,548	1,387,717	-46.4			
Capital	27,343,107	26,500,447	3.2	25,480,317	24,782,430	2.8	26,933,918	25,032,930	7.6	409,189	1,467,517	-72.1			
Continental	14,306,988	8,003,574	78.8	13,440,291	7,332,416	83.3	12,419,182	7,888,419	57.4	1,887,806	115,155	1539.3			
Delta	24,643,813	20,452,114	20.5	22,295,196	18,238,514	22.2	23,668,117	19,600,679	21.8	775,696	851,435	-8.9			
Eastern	49,267,540	58,809,483	17.8	44,963,844	54,956,313	18.2	49,034,923	56,785,514	21.6	232,717	2,023,969	-88.5			
National	13,508,887	11,378,485	18.7	12,174,854	10,063,721	21.0	15,327,726	12,367,303	23.9	-1,818,839	-988,818	-			
Northeast	8,296,514	5,831,664	42.3	7,842,916	5,500,110	42.6	9,508,564	7,350,891	29.4	-1,212,050	-1,519,227	-			
Northwest	23,750,414	19,493,741	21.8	21,349,458	17,597,633	21.4	20,698,077	16,690,693	24.0	3,052,337	2,803,048	8.9			
Trans World	77,736,079	59,647,861	30.3	72,315,922	55,302,055	30.8	65,496,703	52,072,474	25.7	12,239,376	7,575,387	61.6			
United	85,816,168	83,653,579	2.6	74,522,986	73,891,295	0.9	74,577,343	71,037,523	5.0	11,238,625	12,616,056	-10.9			
Western	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.			
TOTALS	\$466,271,762	\$391,950,827	19.0	\$424,150,454	\$354,621,749	19.6	\$424,252,126	\$355,414,705	19.4	\$42,019,636	\$36,536,122	15.0			
INTERNATIONAL															
American	\$1,780,699	\$1,910,528	-6.8	\$1,529,836	\$1,643,318	-6.9	\$1,677,253	\$1,717,397	-2.3	\$103,446	\$193,131	-46.4			
Brantiff	2,216,835	1,992,763	11.2	1,918,990	1,721,154	11.5	2,110,086	2,010,168	5.0	106,749	-17,405	-			
Delta	1,444,179	1,455,871	-0.8	1,348,670	1,340,574	0.6	1,381,390	1,392,561	-0.8	62,789	63,310	-0.8			
Eastern, Overseas	8,040,685	6,880,845	16.9	7,160,001	6,410,277	11.7	6,457,899	6,104,610	5.8	1,582,786	776,235	103.9			
San Juan	5,811,105	4,707,019	23.5	5,117,194	4,332,248	18.1	4,637,714	4,314,658	7.5	1,173,391	392,361	199.1			
Bermuda	849,910	948,323	-10.4	757,309	904,661	-16.3	587,322	679,640	-13.6	262,588	268,683	-2.3			
Mexico	1,379,670	1,225,503	12.6	1,285,768	1,173,368	9.6	1,232,863	1,110,312	11.0	146,807	115,191	27.4			
National	1,030,150	1,246,848	-17.4	950,546	1,138,357	-16.5	993,432	972,651	2.1	36,718	274,197	-86.6			
Northwest	11,149,711	9,931,204	19.5	7,799,623	6,581,253	18.5	9,140,776	7,067,549	29.3	2,080,935	2,663,655	-21.9			
Panagra	4,953,627	4,509,477	9.8	3,757,498	3,210,156	17.0	4,935,871	4,692,446	5.2	17,754	-182,969	-			
Pan American System	104,115,919	91,680,133	13.6	83,582,239	72,132,261	15.9	92,192,143	81,353,350	13.3	11,923,776	10,326,783	15.5			
Non Divisional	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	13,246	n.r.	n.r.	-13,246	n.r.	n.r.			
Latin American	27,128,628	22,910,582	18.4	21,545,406	17,550,490	22.8	27,570,224	23,742,373	16.1	-441,596	-831,791	-			
Atlantic	50,086,556	46,564,701	7.6	42,619,844	39,046,457	9.2	40,154,080	39,002,867	2.9	9,932,476	7,561,834	31.3			
Pacific	25,502,893	21,037,445	21.2	18,194,423	14,581,676	24.8	22,984,649	17,330,763	32.6	2,518,244	3,706,682	-32.1			
Alaska	1,397,842	1,167,405	19.7	1,222,566	953,638	28.2	1,459,944	1,277,347	15.1	-72,102	-109,942	-			
Trans Caribbean	1,564,460	1,422,306	10.2	1,180,435	808,582	46.0	1,396,020	1,333,730	4.7	170,440	88,576	92.4			
Trans World	26,396,527	26,705,457	-1.2	19,189,765	21,728,992	-11.7	24,547,845	23,397,299	4.9	1,848,682	3,308,158	-44.1			
United	5,732,068	4,752,355	20.6	5,461,451	4,472,162	22.1	4,018,691	3,521,179	14.1	1,713,377	1,231,176	39.2			
Western	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.			
TOTALS	\$168,426,860	\$152,487,787	10.5	\$133,879,054	\$121,187,086	10.5	\$148,851,406	\$133,562,940	11.4	\$19,575,454	\$18,924,847	3.4			
LOCAL SERVICE															
Allegheny	\$2,995,814	\$3,079,230	-2.7	\$2,226,945	\$1,678,796	32.7	\$3,153,138	\$2,423,282	30.1	-\$157,326	\$655,948	-			
Bonanza	1,474,179	1,107,519	33.1	951,323	647,003	47.0	1,643,683	1,166,973	40.8	-169,504	-59,454	-			
Central	1,391,023	1,400,543	-0.7	614,108	522,778	17.5	1,352,314	1,254,283	7.8	38,709	146,260	-73.5			
Frontier	3,946,634	1,812,927	117.7	1,630,171	947,576	72.0	3,445,234	1,885,647	82.7	501,400	-72,720	-			
Lake Central	1,202,680	995,970	20.8	703,060	503,530	39.6	1,141,345	951,681	19.9	61,335	44,289	38.5			
Mohawk	2,769,608	2,410,331	14.5	2,113,752	1,628,398	29.8	2,679,855	2,272,517	17.9	89,753	145,814	-38.4			
North Central	4,897,739	4,086,978	19.8	3,454,642	2,473,020	39.7	4,937,141	3,415,646	44.5	-39,402	671,333	-			
Ozark	2,880,255	2,104,951	36.9	1,867,411	1,312,451	42.3	2,716,890	2,029,620	33.9	163,365	75,331	116.9			
Pacific	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.			
Piedmont	3,348,960	2,399,139	39.6	2,021,187	1,614,460	25.2	3,040,618	2,245,144	35.4	308,342	153,995	100.2			
Southern	1,454,365	1,554,459	-6.4	771,980	671,137	15.0	1,535,791	1,236,430	24.2	-81,426	318,029	-			
Trans-Texas	2,122,665	1,782,055	19.1	1,227,007	922,238	33.0	2,089,660	1,697,854	23.1	33,005	84,201	-60.8			
West Coast	1,019,451	1,256,965	-44.7	1,327,387	779,969	70.2	2,322,049	1,279,242	81.5	-502,598	-22,277	-			
TOTALS	\$30,303,373	\$23,999,047	26.3	\$18,908,973	\$13,701,356	38.0	\$30,057,718	\$21,858,318	37.5	\$245,653	\$2,140,749	-88.5			
HELICOPTERS															
Chicago	\$835,568	\$533,777	54.5	\$382,713	\$194,312	96.9	\$676,951	\$498,184	35.9	\$158,617	\$35,593	346.4			
Los Angeles	384,858	348,868	10.9	87,843	53,226	65.0	353,063	292,509	20.7	33,795	56,359	-40.0			
New York	868,165	803,904	8.0	258,225	185,574	39.1	847,184	732,298	15.7	20,981	71,606	-70.7			
TOTALS	\$2,090,591	\$1,686,549	24.0	\$728,781	\$423,112	72.2	\$1,877,198	\$1,522,991	23.3	\$213,393	\$163,588	30.4			
TERRITORIAL															
Caribair	\$811,174	\$567,951	42.8	\$723,042	\$517,841	39.6	\$639,403	\$500,785	27.7	\$171,771	\$67,144	155.7			
Hawaiian	2,209,769	2,686,289	-17.7	1,732,657	1,609,271	7.6	2,183,210	2,182,334	...	26,559	503,955	-94.7			
Trans Pacific	1,333,446	773,334	72.4	1,283,121	701,519	82.9	1,110,840	690,354	60.9	222,605	82,980	168.3			
TOTALS	\$4,354,388	\$4,027,574	8.1	\$3,738,820	\$2,828,631	32.2	\$3,933,453	\$3,373,473	16.6	\$420,935	\$654,101	-35.6			
ALASKA															
Alaska	\$2,338,126	\$1,779,302	31.4	\$850,764	\$699,555	21.6	\$2,274,517	\$1,708,911	33.1	\$63,609	\$70,391	-9.4			
Alaska Coastal	588,822	492,283	19.6	362,499	286,654	26.4	584,796	403,981	44.8	4,026	88,302	-95.4			
Cordova	328,898	248,924	32.1	54,247	40,818	32.9	302,745	268,193	12.9	26,153	-19,269	-			
Ellis	378,143	326,896	15.7	227,059	195,309	16.3	392,599	274,371	43.1	-14,456	52,525	-			
Nor. Consolidated	786,711	790,763	-0.5	323,077	285,322	13.2	787,890	646,209	21.9	-1,179	164,554	-			
Pacific Northern	3,571,327	3,332,064	7.2	2,618,414	2,396,163	9.3	3,068,245	2,488,371	14.1	503,082	643,693	-21.8			
Reeve	720,832	809,687	-11.0	402,535	453,290	-11.2	556,570	494,717	12.5	164,262	314,950	-47.8			
Wien	1,470,474	1,363,981	7.8	558,153	406,646	32.3	1,429,701	1,320,293	8.3	40,773	43,688	-4.7			
TOTALS	\$10,183,333	\$9,143,880	11.4	\$5,396,748	\$4,763,757	13.3	\$9,997,063	\$7,805,046	20.4	\$786,270	\$1,338,834	-41.3			
ALL CARGO															
	Cargo Revenues			Charter Revenues			Total Operating Revenues			Total Operating Expenses			Operating Profit or Loss		
	1959	1958	% Change	1959	1958	% Change	1959	1958	% Change	1959	1958	% Change	1959	1958	% Change
Aaxico	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
Flying Tiger	\$4,047,688	\$3,018,355	34.1	\$4,317,967	\$4,901,399	-37.4	\$8,339,878	\$9,910,790	-15.9	\$7,456,491	\$8,315,556	-10.3	\$883,387	\$1,595,234	-44.6
Riddle	1,087,182	1,181,611	-8.0	107,513	964,457	-88.8	1,209,798	2,154,492	-43.8	1,421,437	2,677,851	-46.9	-211,639	-523,359	-
Slick (charter)	n.r.	n.r.	n.r.	2,865,757	1,853,387	54.6	2,964,917	1,940,801	52.8	2,670,963	1,529,899	74.6	293,954	410,902	-28.5
Aerovias Sud	310,253	376,586	-17.6	39,229	80,537	-51.3	378,563	464,146	-18.4	344,639	463,650	-25.7	33,924	496	+100
Seaboard & Western	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.	n.r.
TOTALS	\$5,445,123	\$4,576,552	19.0	\$7,330,466	\$9,799,780	-25.2	\$12,893,156	\$14,470,229	-10.9	\$11,893,530	\$12,986,956	-8.4	\$999,627	\$1,483,273	-32.6

1958 World Airline Statistics

Things come slowly from IATA, the International Air Transport Assn., and the final statistics of 1958 operations by its members are no exception. Usually published seven months after the year ends, the IATA report this year be-

came ensnared in a British press shutdown, didn't get published until mid-October, too late for November AIRLIFT.

Below is a summary of 1958 performance revealing the predominance of the so-called "big four" U.S. carriers.

	Revenue Passengers (000)	Revenue Pass. Miles (000)	Rev. Pass. Load Factor	Rev. Hours Flown	No. of Aircraft	No. of Employees	
Aer Lingus	450	115,520	64.8	27,243	20	1,905	Aer Lingus
Aerolineas	475	311,991	61.9	75,833	38	5,930	Aerolineas
Aero O/Y	395	104,711	50.5	34,871	16	1,184	Aero O/Y
Aerlinite Eireann	12	36,160	35.0	4,123	3	71	Aerlinite Eireann
Aeronaves	377	225,892	61.7	36,435	23	1,982	Aeronaves
Air Algerie	350	186,226	66.1	25,151	17	1,036	Air Algerie
Air Ceylon	56	28,399	53.2	7,236	3	299	Air Ceylon
Air France	2,400	1,968,129	62.7	243,568	122	20,040	Air France
Air India	81	245,746	58.9	26,504	11	4,549	Air India
Air Vietnam	87	29,977	61.4	7,837	7	837	Air Vietnam
Air Liban	56	39,325	38.7	9,906	8	501	Air Liban
Airwork	7	31,372	68.3	3,518	10	477	Airwork
Alitalia-Lai	457	471,846	54.4	76,861	45	4,074	Alitalia-Lai
American	7,800	5,005,092	65.6	542,750	191	21,461	American
Ansett-Ana	786	358,566	56.7	77,029	34	3,677	Ansett-Ana
Aua	28	11,838	23.8	4,884	4	285	Aua
Aviacion Y Comercio	178	40,537	60.4	15,008	15	712	Aviacion Y Comercio
Avianca	1,093	329,407	56.6	88,227	47	5,280	Avianca
BEA	2,726	943,295	62.5	189,210	112	11,592	BEA
BOAC	465	1,422,232	60.5	155,152	63	19,035	BOAC
Braniff	2,137	1,001,845	57.9	180,117	70	5,113	Braniff
CAAC	159	84,349	62.6	22,698	17	1,228	CAAC
Chicago	109	1,990	37.2	9,585	8	151	Chicago
CAT	84	29,847	43.0	8,578	28	530	CAT
CPAL	245	349,536	54.8	51,464	41	2,418	CPAL
Cruzeiro	467	196,474	50.6	68,211	62	4,047	Cruzeiro
CSA	341	107,044	64.7	25,859	40	1,707	CSA
Cubana	337	156,728	57.4	26,260	10	1,064	Cubana
Cyprus	34	17,919	52.6	3,505	4	142	Cyprus
Delta	2,826	1,467,891	58.2	196,945	79	6,317	Delta
DETA	27	11,924	55.6	9,598	17	383	DETA
DTA	36	10,125	48.1	8,454	14	381	DTA
EAAC	117	45,581	47.3	23,896	17	1,527	EAAC
Eagle	22	10,796	45.5	4,127	13	491	Eagle
Eastern	7,267	4,277,807	53.1	536,545	196	16,365	Eastern
El Al	66	160,235	57.3	13,420	8	1,566	El Al
Ethiopian	91	46,902	40.6	14,896	19	772	Ethiopian
Flagship	69	26,055	46.3	7,880	9	210	Flagship
Flying Tiger	c	c	c	19,032	16	1,351	Flying Tiger
Garuda	269	119,368	73.7	27,589	39	3,957	Garuda
Guest Aerovias	34	46,638	51.5	5,074	2	360	Guest Aerovias
Hunting-Clan	11	38,179	70.1	9,103	11	368	Hunting-Clan
IAC	616	292,363	63.7	108,643	83	9,418	IAC
Iberia	749	338,232	55.1	61,235	36	3,021	Iberia
Iranian	80	23,490	37.4	11,797	17	556	Iranian
Iraqi	79	29,878	50.3	6,687	8	726	Iraqi
JAL	455	379,111	66.2	46,339	23	2,345	JAL
JAT	128	36,624	NA	13,924	22	897	JAT
KLM	911	1,229,364	53.3	174,767	91	16,900	KLM
LAN	290	155,387	64.1	31,627	31	1,617	LAN
LAV	362	127,586	38.3	57,426	45	2,092	LAV
LOT	126	43,838	56.2	17,192	37	1,776	LOT
Lufthansa	550	412,749	53.2	72,508	29	6,040	Lufthansa
Middle East	87	68,844	40.8	17,880	13	1,042	Middle East
Malayan	143	37,531	56.2	23,061	15	1,225	Malayan
Misrair	133	62,980	60.1	16,110	15	1,685	Misrair
National	1,642	1,055,467	55.8	121,301	45	4,403	National
New York	90	1,726	44.6	6,681	6	201	New York
Northwest	1,827	1,408,701	54.7	162,550	59	6,476	Northwest
NZNAAC	530	143,200	75.3	52,811	29	1,678	NZNAAC
Olympic	315	87,058	50.9	22,054	20	1,219	Olympic
PAA	2,803	3,575,773	62.6	389,581	133	26,150	PAA
PAB	323	293,092	47.2	66,435	21	4,536	PAB
PAL	482	112,541	60.0	44,599	30	2,063	PAL
Panagra	127	160,140	53.1	21,641	16	1,341	Panagra
PIA	207	142,244	56.2	25,499	18	3,657	PIA
Qantas	148	466,912	58.7	66,756	33	6,093	Qantas
Quebecair	140	15,833	45.5	8,792	11	192	Quebecair
Real Aerovias	2,011	470,726	49.6	153,355	107	6,705	Real Aerovias
SAA	303	258,986	60.1	37,328	25	2,678	SAA
Sabena	823	744,438	56.0	127,583	79	9,110	Sabena
SAS	1,525	1,157,744	54.7	158,927	59	12,147	SAS
Seaboard	c	c	c	13,855	12	886	Seaboard
Skyways	59	11,739	58.3	3,301	25	830	Skyways
Swissair	1,059	630,425	59.0	80,304	34	5,429	Swissair
TAA	851	415,417	71.0	91,371	44	3,993	TAA
TAI	61	195,335	56.7	24,664	13	1,276	TAI
TAP	69	76,681	53.9	9,941	11	1,009	TAP
TCA	2,806	1,617,494	69.2	210,454	88	10,043	TCA
TEAL	67	90,261	76.0	9,581	4	829	TEAL
THY	393	101,419	74.4	32,136	26	1,420	THY
TWA	4,667	4,409,566	62.5	476,032	189	18,626	TWA
UAL	7,238	5,163,341	64.3	525,495	197	19,961	UAL
UAT	165	231,393	59.0	40,075	23	2,042	UAT
Varig	559	273,502	60.0	80,172	49	4,525	Varig
WAAC (Nigeria)	73	22,350	51.1	16,853	17	1,366	WAAC (Nigeria)
TOTALS	69,249	46,705,276	59.6	6,663,000	3,406	366,000	

Trans Caribbean figures not available. Revenue hours and number of employees rounded to nearest 1,000. IATA rev. pass. kilometers converted by AIRLIFT to rev. pass. miles c—Cargo carrier, NA—not available.



How's the Caravelle Doing? Fine!

After half a year of operation, Air France and SAS report most Caravelle troubles are minor. In words of one syllable, they like it.

How is the Caravelle doing in operation? Fine, according to reports from Air France and SAS which have been operating the Sud Aviation twin-jet transport since spring.

This excellent record to date is especially remarkable in view of the newness of the aircraft. SAS points out that its first Douglas DC-6 was the 106th production aircraft while its first DC-7C was No. 695 of the DC-6/7 series. On the other hand, SAS' first four Caravelles were third, fifth, sixth and eighth.

Despite this, the record of the Caravelle in its first six months of operation with SAS shows that it had less (700) technical malfunctions per 1000 take-offs than the DC-7C (1540) or the DC-6B (940). The number of technical delays per 1000 take-offs was 47 for the Caravelle compared with 77 for the DC-7C.

Air France tells a similar story. For each 1000 hours of Caravelle operation there have only been 0.7 hours failure with a delay of 1.67 hours, and no engine changes outside the main base. This is contrasted with "a largely used piston engine in service for years" which has a failure rate of 2.9 hours with a delay of 43.10 hours for each 1000 hours of operation.

The reliability of the Rolls-Royce Avon engine means that Air France is able to operate with fewer spare engines and parts. Despite the rear-fuselage location of the engines there has been absolutely no center of gravity or weight/balance problems. SAS reports that the fuel metering system, "as in nearly all other aircraft, has not worked to our entire satisfaction" requiring excessive amounts of fuel for navigation reserve and holding.

Pilot reaction to the Caravelle has been extremely favorable. The quiet cockpit and easy engine handling help reduce fatigue. Effective speed brakes make the Caravelle fit easily into traffic patterns, let it lose altitude and also decrease speed quickly. The autopilot

and automatic approach system are also liked by pilots. Given a good ILS installation, the autopilot will fly an ILS approach better than most pilots, SAS reports.

Caravelle approach speed is similar to the DC-6B and DC-7C, but SAS maintains minimum final approach speed from the outer marker with flaps fully down. This gives a low approach speed but requires more flying precision.

SAS braking experience has differed from that of Air France since the French airline initially did not specify tail parachutes but now is having them installed. Due to the clean aerodynamic design and lack of reverse thrust on Caravelle's Avon engines the brakes must work very hard and have given trouble, particularly during landings on wet runways. The Ministop anti-skid device and the entire braking system are being improved. Moreover, tests are being run with a reverse thrust installation.

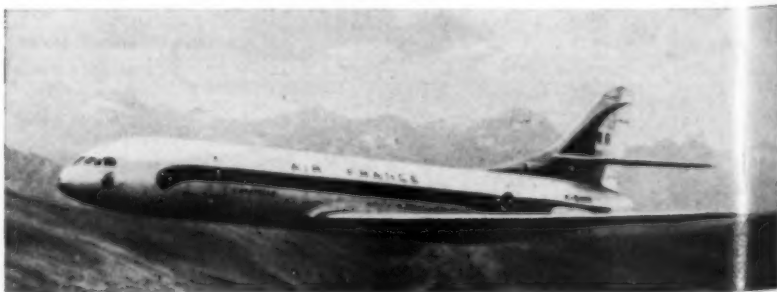
The hydraulic system has also proved troublesome. The servodynes have worked well but pressure regulation has been a problem. After encountering some leaks due to overpressure, Air France is replacing 12 pipes with steel parts. SAS also mentions cracked tubes and regulator spring failures.

Structure has given little trouble except for some localized cracks in the tail and flaps for which strengthened components are being designed. A similar report comes from SAS which

says that "there have been a few cracks in the rudders, elevators and flaps—not in load carrying structures—but all these control surfaces are now being reinforced and there is no reason to expect further cracks in these areas in the future. Other minor problem areas, now reported by SAS as "under control," include automatic air conditioning and de-icing temperature control, where some of the tubes have shown some cracks.

The de-icing system for the cockpit windows have been criticized by some flight crews. Air France reports that Sud Aviation is designing a new Caravelle cockpit with improved visibility. Actually the visibility from the present Caravelle is far better than it appears to be from the outside, since the angle of vision is forward and downward. This gives good visibility during the descent and is needed because of the high angle of attack during climb. Instruments have been working well although SAS reports originally installed pitot tubes had insufficient de-icer heat. Air France notes that the airspeed indicator "has not quick or precise response" during take-off because of the high rate of acceleration.

Air France is pleased with the Caravelle's ability to start on its own battery. An average of six starts can be made, thus eliminating ground starters at out stations. Because the Caravelle has a 115 v DC electrical system it would be very expensive to



An Air France Caravelle at work.

provide a cart equipped for that voltage at each station.

With a twin-engine aircraft there is a risk of half the electrical power being lost with one engine inoperative, and the amount of electrical power available on the Caravelle is considered marginal for the amount of electrical equipment installed and the large electric de-icing requirement, in the opinion of Air France. SAS Caravelles are being equipped with alternators.

Both Air France and SAS emphasize that problems have been strictly minor. SAS has found that a 30 minute ground time is perfectly feasible provided airport authorities regard the jet as just another aircraft. The airline is still encountering difficulties in this respect—at several places authorities insist that it be parked some distance from the terminal building, which raises loading and unloading problems. The only trouble caused by aircraft design is the rather small cargo space.

From passenger reports, the Caravelle has been an outstanding success. In its first six months of operation with SAS the aircraft carried 70,000 passengers and flew some 5,500 hours. In a survey of American passengers, SAS found 95.8% considered flight characteristics "excellent" while 79.1% described cabin noise as "completely absent."

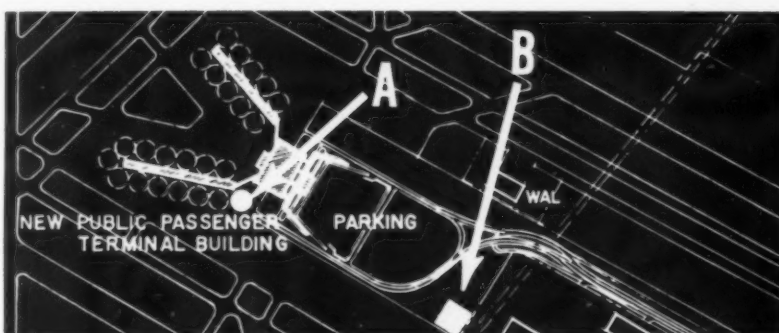
SAS passenger load factors were high last summer although not as high as those of the big jets on non-stop long-haul routes. On some routes, moreover, load factors were impressive—on the Paris-Istanbul service in July Air France's load factors averaged above 75%. SAS says that load factors on trunk routes within Europe this summer ranged between 60 and 85%.

On economy, SAS reports that a cost comparison based on operation experience between the jet and the DC-7C on a typical Europe-Middle East route shows that the variable operating costs per round trip and per seat-mile are 20 to 25% lower for the Caravelle. When comparing costs per ton-mile the difference drops to about 17% since the DC-7C has more freight capacity.

SAS points out that with its modern design the Caravelle will maintain its competitive potential for several years to come. Consequently the airline feels that it is sound to apply a longer depreciation period for the jet than for competitive piston-engine or turboprop aircraft.

The success Air France and SAS have met with the Caravelle is encouraging to such airlines as Varig, Finnair, CGTA-Air Algeria, Royal Air Maroc and Swissair which will be putting the French jet into service in the next few months.

BUSINESS FLYING



A is exec plane loading gate, B marks future location of transient service hangar.

This Airport Welcomes Business Planes

Executive aircraft operators may be getting the cold shoulder in the planning of most big new airports throughout the U.S., but not at Wold Chamberlain Field, Minneapolis.

The Minneapolis-St. Paul Metropolitan Airports Commission, under executive director, R. "Bob" Aldrich, is going all out to see that the opposite is true in the Twin Cities.



ALDRICH

Not only will a new aircraft servicing hanger and fueling facilities for business operators be located immediately adjacent to a new \$8.2 million passenger terminal, but a loading gate will be provided for their use at the "close-in" end of one pier.

Aldrich's philosophy: "The number

of business aircraft operators is mounting fast and they cannot and should not be denied. His views are diametrically opposed to those of the Port of New York Authority which discourages exec plane operations into New York's Idlewild Airport.

In the Aldrich plan, still to get a final OK, will be a convenient hangar situated between the terminal parking lot and Northwest Airline's new base. It will be fitted to handle de luxe type turnaround or through service and all the other needs of an executive pilot such as fueling and aircraft servicing.

For business flights "connecting" with airline operations, it will simply be a matter of taxiing into a special gate position on the ramp. In most instances, the executive arriving by company plane will be entering the terminal at a point nearer to airline operations than the average passenger arriving by limousine or private car.

Flight Electronics Takes Over at Westchester

Flight Electronics Corp., a new company formed this year, is now the occupant of Hangar F at the Westchester (N.Y.) County Airport, where many companies base their business aircraft. This was the first hangar on the field and was successively leased by International Telephone & Telegraph Corp., Johns-Manville and Lear, Inc.

Sydney M. Nesbitt, former general manager and part owner of Atlantic Aviation Corp., is vice president and general manager of Flight Electronics. Other officers include Benjamin B. Peck, president of Elba Management Corp., president; Alexander E. Chaite, president of Alexander E. Chaite Studios, secretary, and Herman M. Cole, consulting architect in New York,

treasurer, all of whom fly their own airplanes.

When Lear decided to give up the Westchester facility, because it found itself going into competition with its own customers, it gave the new company the opportunity to acquire a facility fully equipped for comprehensive aircraft radio and electronics installation and service, together with a staff of qualified technicians. Among the features are the only L-5 and L-2 autopilot test stands east of Grand Rapids. Nesbitt reports that executive aircraft from all over the U.S. are now coming to the company for service.

Flight Electronics is a distributor for Lear and Wilcox and is a dealer in Collins, Bendix, ARC, Narco, Dare and others.



Reverse-thrust of jet-powered propellers brake "Ski-130" transports to short, safe stops. Giant skis, fitted over landing wheels, retract to permit landings on or takeoffs from surfaced runways.

Heavy steel structures, pre-fabricated in 40-foot sections, were part of DEW Line cargo airlifted from Sondrestrom AB, Greenland by 61st T.C.S. of the Tactical Air Command's 9th Air Force.





Airlift in action:

Building a base on Arctic ice

Flying through 40-below storms and fog, Lockheed-built C-130 HERCULES transports of the U. S. Air Force ski-landed 26 million pounds of cargo on Greenland's ice cap. Tractors, trucks, machinery, tools, pre-fabricated radar towers and buildings, lumber, cement, crates by the hundred — plus the personnel needed to build two vital new DEW Line bases. Mission accomplished (ahead of schedule), the "Ski-130" planes headed for Antarctica to support a U. S. Navy expedition.

No matter where or what the job, Lockheed prop-jet C-130 HERCULES transports provide more Jet Age airlift per dollar than any cargo aircraft flying.

LOCKHEED

GEORGIA DIVISION



National Airlines — first with pure jets in the U. S. A. — now offers air travelers jet-powered Lockheed Electra service! National's Electra flights now serve Miami, Tampa,

Havana, New York and Boston. Other cities will be added to National's Electra route as delivery of the ordered prop-jets is made. National's Electras are Texaco lubricated.

Turbo-Prop engines

ON NATIONAL AIRLINES' ELECTRAS

Lubricated with Texaco

The mighty turbo-prop Allison engines that power National Airlines' Electras — now in service between Boston-New York-Miami-Tampa and Havana—are lubricated exclusively with Texaco, for three important reasons:

- **Flight proved.** Texaco Synthetic Aircraft Turbine Oils combine all characteristics essential to jet service: low viscosity at low temperature; low volatility; oxidation resistance and thermal stability at high temperature; non-corrosiveness to engine metals; and excellent gear load-carrying ability.
- **Refinery sealed.** Because Texaco Aircraft Turbine Oils must meet highly critical tolerances, Texaco takes special precautions in packaging and handling to make sure they're in "mint condition" until the moment they're used. Packages are refinery-sealed and clearly marked to minimize chance of misapplication.
- **Demonstrated quality and service.** Texaco has lubricated National's piston-engine planes since 1938. That's

a total of 258,350,300 airline miles lubricated with Texaco Aircraft Engine Oil exclusively.

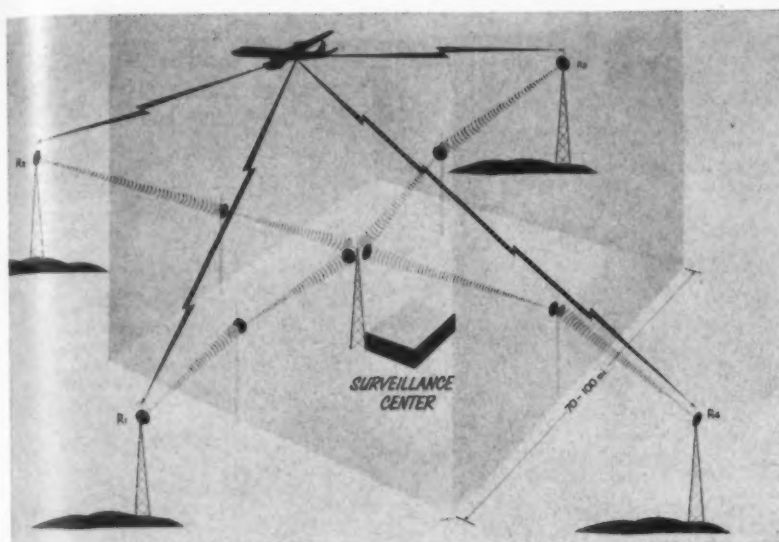
For complete data on Texaco aviation fuels and lubricants, contact any one of the more than 2,300 Texaco Distributing Plants, or write Texaco Inc., *Aviation Sales Department*, 135 East 42nd Street, New York 17, N. Y.

Tune In: Texaco Huntley-Brinkley Report, Mon.-Fri.-NBC-TV



TEXACO
LUBRICANTS
AND FUELS

FOR JET, PROP-JET AND PISTON-ENGINE AIRCRAFT



Why Not Traffic Control in 3-D?

Loctracs' 700 receiver-sectors could watch up to 700,000 different aircraft—and keep 'em sorted

A new air traffic control system—called Loctracs, for Lockheed Tracking and Control System—has been developed by Lockheed Aircraft Corp's Electronics and Avionics Division (LEAD).

In the works for a year, Loctracs proposes to divide the nation's air routes into a series of "sectors" about 70 to 100 miles square and 100,000 ft. high. The sectors, each containing four receivers arranged in a quadrangle, would contain a microwave or telephone cable system link with a master surveillance center which would untangle the series of individual, pulse coded transmissions received from airborne aircraft and plot their position vertically as well as horizontally.

This "three-D" traffic control system would require a minimum of 250 sector-receiver installations to cover all major U.S. airways. But Lockheed figures that 700 such systems could blanket the nation and provide high density coverage around major air terminals.

Only one frequency would be used, and that could be any line-of-sight frequency. Aircraft would be identified by the specific pulse coding assigned to them, which they would transmit 35 times every minute.

Four of these pulses would be a syn-

chronizing pattern. Seventeen would identify the aircraft, and six would give the aircraft's altitude. Nine reserve pulses could be used for flight number, destination, emergency alert or other canned messages. The 17 identity pulses would be sufficient to differentiate between more than 130,000 different aircraft.

The 36 identity and info pulses would be in addition to position pulses, which would be transmitted at a rate of 600 times per minute. They would be decoded by a coincidence detector

Loctracs' claim to fame

1. It will "see" all aircraft in service at any one time.
2. It can provide location, altitude and identity data in one package without human attention.
3. It will track aircraft not on prescribed flight plans.
4. It can "see" 100% of traffic, even in congested areas.
5. It needs no ground transmission, thus prevents unwanted "homing."
6. Its operation rate is high enough to cover present and future needs for some time to come.
7. It will "see" aircraft too small to register on today's radar screens.

which would translate them into readable position information.

Aircraft position would be pinned down to a square mile under normal circumstances, though the equipment can spotlight an area as small as a sixth of a mile or less on each side.

As for altitude, increments of 60 ft. would normally be used at altitudes around 1,000 ft. Above 10,000 ft., 600 ft. increments would be sufficient.

According to Lockheed, Loctracs can pick 1,000 different aircraft out of a sector at any given time. If the detection equipment is linked to a computer it could automatically warn of collision courses or other aerial troublemakers.

The 55-microwatt airborne transmitter would be tagged at about \$200 for private aircraft and about \$500 per installation for commercial and military users. Built into a compact cube about six in. in size, the transmitter would weigh less than five lbs.

To achieve the 700 sectors recommended, the U.S. would have to shell out approximately \$280 million for the Loctracs alone. To add sites, roads, structures and so on would require another \$420 million or so, making the final figure \$700 million. So says M. Carl Haddon, v.p.-gen. mgr. of LEAD, who predicts that it would take in the neighborhood of \$30.5 million to outfit all U.S. planes with airborne transmitters.

Electronics Take Over Transport Holding Control

A prototype of a holding pattern programmer which will automatically keep an aircraft in a holding pattern while it is under the control of an automatic flight control system has been devised by the Eclipse-Pioneer Div. of Bendix Corp., Teterboro, N.J.

The programmer performs all of the sensing, logic and control functions necessary to keep the aircraft in its proper pattern after the pilot has set it up initially. As the aircraft proceeds around the "racetrack" pattern, signal lights indicate the progress of the maneuver.

The programmer provides crosswind correction, stores the information and then releases it at just the right times to provide crosswind correction on the opposite leg and for turns.

The programmer can be housed in a standard 3/8 ATR (air transport rack) with a weight of 12 lbs. The selector and indicator are in an enclosure 5½ in. high by 7½ in. wide weighing two lbs.

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COCKPIT

By CAPT. J. D. SMITH

All We Want for Christmas is Airborne Radar

Ask any pilot who flies weather "What piece of equipment do you want most?" Chances are the answer will be airborne radar.

Asked why, he may reply that airborne radar can provide a safer flight through thunderstorm activity; provide the most economical means to a satisfactory passenger ride; and result in avoiding bad weather without unnecessarily complicating the present ATC system.



These are but a few of the advantages. What are the disadvantages? Pilots would probably say "none."

FAA apparently believes airborne radar is vital equipment for penetrating thunderstorm areas. This position is best evidenced by their proposed Draft Release 59-10 which makes airborne radar mandatory for all commercial IFR and night VFR operations. To date only the Air Transport Association has opposed this proposal.

In this regard, the ATA position is confusing, especially since the airlines initially evaluated airborne radar and developed supporting data justifying the installation of this equipment. Obviously, airborne radar has merit, else it would not be in many aircraft.

Quesada has had a tough year

General Quesada will shortly complete his first year as FAA administrator. Too few individuals appreciate the tremendous task he has been facing in reorganizing the previous CAA to adhere to the Aviation Act of 1958.

A basic reorganization problem, from the users' standpoint, is the recognition by FAA that there is a marked difference between methods of doing civilian and military business. Many criticisms of FAA are directed more at the manner of accomplishing goals than at the goals themselves. Surely no one would oppose FAA programs intelligently designed to improve safety and foster further expansion of all aviation—particularly when Congress specifically charged FAA with this responsibility.

Draft Release 59-10 is causing more than casual interest among the airline pilot group. Aside from strongly supporting this proposal, the airline pilot is concerned with FAA's announced across-the-board interest in overall operation safety. Failure to require airborne radar in aircraft which operate in known thunderstorm activity cannot help but cause airline flight personnel to question FAA's sincerity.

The goal of Draft Release 59-10 is sound. The mandatory requirement should apply only when the equipment is needed. This requirement flexibility is applied to many other components today, and can cover airborne radar. Thunderstorm forecasting is not yet

a precise art, but much has been learned about the potential danger of unstable atmospheric conditions. Gust loads which exceed current airframe design requirements have been recorded. The rapidly changing atmospheric conditions of thunderstorms place a pilot in a hit or miss situation when he doesn't have airborne radar.

It also makes him conduct a quiz program with himself. A pet philosophy of mine is that when a pilot makes guesses about his operation, he is treading thin ice. If he is forced to continue guessing, sooner or later the odds win out, often disastrously.

Flexibility essential

I can appreciate some of the flexibility which ATA would like to incorporate in the mandatory airborne radar proposal. If the pilot does not need airborne radar, let the flight continue. This makes sense.

However, the basic theme of ATA's position leaves me cold. Because not too many aircraft have been lost, it's said nothing should be done; that we should wait for some unnecessary accidents and then correct the problem. This is a typical defensive approach to the solution; especially when you consider that only rarely are airlines voluntarily installing airborne radar in piston-engine aircraft.

The exposure is known. The problem is understood. The solution calls for prevention, not correction.

Possibly there will be a public hearing dealing with the mandatory airborne radar proposal. Whether there is or not, here are some items FAA should consider.

For a number of years, flight personnel received valuable information on adverse weather conditions from Air Defense Command radar sites. This has been discontinued. What replaces this service? More guessing?

During this same period, pilots could get helpful information from CAA/FAA radar equipment. This same ground-based radar has been modified to eliminate adverse weather presentation. What replaces this assistance? More guessing?

An airline aircraft is not permitted to leave an en route station if icing conditions are known and it has an inoperative deicing system. Is this any different from sending an aircraft into known thunderstorm activity if it doesn't have working airborne radar?

In view of thunderstorm research data which is available, is FAA fulfilling its statutory mandate for aircraft and passenger protection by refusing to require airborne radar?

Why has one airline long since seen fit to require working airborne radar when flying into thunderstorms.

General Quesada has advised his people to be "Fast-Factual-Fair-Firm" in their dealings with the airlines. When it comes to airborne radar, I say, "prove it."

What would we pilots like for Christmas? Airborne radar.



The intensity of the competition in the commercial jet market is illustrated by the warranties Convair is offering to 880/600 buyers. Earlier this year when Frank Pace and Earl Johnson, chairman and president respectively of General Dynamics Corp., appeared before the New York Society of Security Analysts, Johnson brought out the fact that in its flight program the Convair 880 has equalled or exceeded all performance forecasts, including those of range, speed, altitude, landing and takeoff distances and fuel consumption.

Johnson then went on to say: "As a result, we have given for the first time a 'mission guarantee' on this plane. We think this is a tremendous advantage to future sales because the airlines have the assurance that they can take a certain load and carry it a certain distance on certain fuel consumption and in a certain period of time. No other manufacturer gives such a guarantee nor can it be equalled."

American's Turbofan Program

One of the more significant "mission guarantees" covers the 25 turbofan 600s ordered by American Airlines. Convair has given American a flat guarantee that it can operate the 600 between LaGuardia and Midway. This guarantee, of course, is based on the takeoff and landing characteristics of the Convair turbofan. In view of the present tumult over jet noise, we do not know what methods Convair—or American—may plan to employ in soothing the emotional perturbations of the New York Port Authority or the now docile, but likely to be aroused citizens of Cicero, but success should score a triumph both for the manufacturer and for the airline.

Flying 600s between LaGuardia and Midway, American would have the fastest jet service between the nation's two biggest cities, New York and Chicago. And by operating Boeing 707s into Idlewild and O'Hare and Convair 600s into LaGuardia and Midway, it would catch a big portion of the connecting business coming and going at these two top traffic centers.

Profits Are Elusive

There's an old gag: You can't take it with you. We might add, colloquially, you can't hardly get it, either. We overheard a Boeing man discussing the 707. "We started out with a breakeven point of \$8," he said. "Then we went to 144. Now it's up to 200." Douglas, early in the game, speculated on a breakeven point of 75 in pricing the

DC-8. Then it went to 90. Where is it now? We've heard Douglas had \$400 million invested in the DC-8 before it delivered a plane. Actually, it is doubtful if any company knows where its breakeven point is these days. Costs keep going up. The breakeven point changes every month.

It's Later Than You Think

We wouldn't bring this up, but lately all the talk seems to be that a supersonic jet transport is 10 or 15 years away. Yet it was only seven years ago that William Pereira, the Los Angeles architect, who was Charles A. Luckman's partner at the time this firm received a contract to work on a master plan for the Los Angeles International Airport, discussed the need for plans for commercial jetliners with Dutch Kindelberger, chairman of North American Aviation and an experienced builder of jet aircraft for the military. "You do not have to worry about commercial jets," said Kindelberger. "They are uneconomical and they cost too much." They were, too. But look what happened!

Leverage in Douglas Shares

Douglas is selling on the market—or was at this writing—at less than its book value. At the end of last year this was reported at \$46.21 per share. The market price is around \$40. This reflects losses incurred through DC-8 writeoffs. Douglas accounting policy is to charge off development costs on a project as they occur. Douglas also has found production costs on the DC-8 higher than anticipated and inventory writedowns on early airplanes, on which the learning curve has been high, have had an adverse effect on earnings. This accounting policy means that in 1960 when deliveries reach peak, Douglas will show earnings on the DC-8 irrespective of whether it ever attains the breakeven point in sales.

Douglas writeoffs on the DC-8 are in the area of \$200 million. If the com-

pany does succeed in pushing up sales to the breakeven point that would mean all of this \$200 million would be recovered. On the basis of 3,817,000 shares outstanding that would represent \$52 per share and would provide the Douglas company with an eminently satisfactory earnings picture, particularly if all other departments were breaking even—or showing a profit—at the same time. But if you think this is a sure-fire capital gains opportunity to get rich, you might bear in mind that about the time DC-8 profits start booming Douglas may be launching a new writeoff program with another airplane, the DC-9.

This Is Optimism

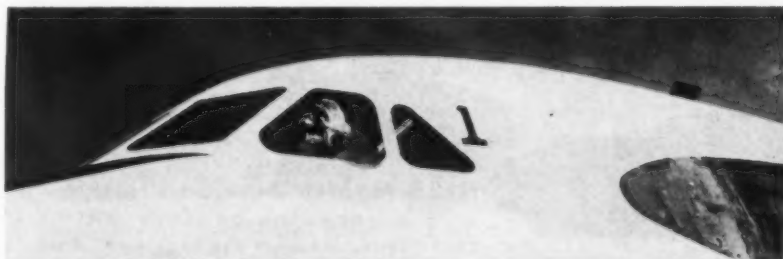
Pacific Southwest Airlines, the surprisingly successful California intrastate carrier, now flying Lockheed Electras, first ordered three of the turboprops, then later one more. But when Kenneth Friedkin, PSA president, applied for FAA numbers he reserved a block of five. Looks as though Lockheed's sales department could reasonably feel it has one more sale in the bag.

New Idea for Old Equipment

Jack Connelly, president of Pacific Air Lines, thinks the big trunks are missing a bet by not converting their old DC-7s and Super Constellations to sleepers for overnight transcontinental schedules. Jack is sure a lot of passengers would much prefer an eight-hour flight in a birth in a piston-engine plane to five hours in a situp seat in a jet and would pay a premium fare for it.

Long-Range Commuter

For years Harvey Tafe has commuted between Santa Monica, where he prefers to live, and San Diego, where he works for Convair. Now Convair has given him a new job, director of foreign military sales, and thus has set the stage for the world's first Polar Route commuter. SAS will love him.



A side view of the Convair 880 cockpit—No eyebrows.



• **Japanese railroads** are noted for their punctuality. When the delegates to the annual IATA general assembly in Tokyo in October were taken on a three-hour train ride to Nikko, site of some of Japan's most famous shrines, the airline executives got some evidence of how seriously the Jap railroads take their on-time operations. As the train neared the end of the run, a railroad functionary announced over the loudspeaker system that the engineer reported with deep regret and

apologies that the arrival would be 30 seconds behind schedule. It was no gag, either. For a few seconds the airline people looked baffled, then broke out into howls and handclapping.

• **A goof by American Airlines** during the issuance of the new and improved air travel cards drew an amusing letter from a Pasadena, Calif., firm. The new card is wonderful, wrote Utility Metal Products, but it was going to have to return its copy for correc-

tion. Seems that it read: "Untility Mental Psod Div." Said the letter: "We admit that at times we feel the name as shown could easily apply but we think it best to keep it a secret."

• **An FAA official** tells this one—but adds quickly that no fine was assessed. A four-engined piston airliner was in for overhaul. A fuel tank had been opened, repaired and sealed. But the fuel system didn't seem to function properly. An FAA inspector insisted the fuel tank be re-opened. It was. And three cases of Coca Cola were found inside. The workmen had put the cases aside and no one had spotted them when the tank was sealed.

• **Only airport terminal** in the country that consists of a trailer is at Page, Arizona, served by Bonanza Air Lines. Not a big trailer, either. Half is devoted to BAL communications, etc., and the other half consists of a tiny counter. Airconditioned, it even has both ladies' and mens' rooms.

• **Here's a DC-3** that has everything. Austin Goodwin, of Houston Lumber Co., trapped a wild mink and knew just what to do with it. Houston Lumber's DC-3 now has mink-covered door knobs and a mink-covered seat in the throne room.

• **United Air Lines** took a fourth grade class on a tour of Baltimore's Friendship Airport as part of its educational program. Following the visit, the class drew some fine pictures of the control tower, a UAL plane, the plane's galley, etc., each with comments. One of the nine-year-olds, Julie, chose the baggage room as her subject. Her comment: "When the men take the luggage off the plane it goes to the luggage room and if you notice you see a tag on the handles of the luggage. The tag has each person's name on it. And if the people do not have the right luggage they come back screaming that they have the wrong bags and a man gives the right bags back."

• **Joe Tavares** recently received his 20-year pin from Pan American World Airways. PAA has given any number of such pins, but what makes this one unusual is that Joe is only 34 years old, and he's believed to be the youngest person in company history to complete 20 years of service. Tavares joined PAA in 1939 at Horta, Azores as an aircraft cleaner. At present he's senior dispatcher at Santa Maria.



For DC-8 Passenger Comfort

Airline passengers' dispositions are as changeable as the weather—especially if cabin thermometers go up or down with outside temperatures. That's why United Air Lines has joined with other progressive airlines throughout the world in selecting Hokanson H-35 Mobile Air Conditioners. The 19 units in United's initial order will assure "comfort zone" temperatures when passengers board its planes. The Hokanson H-35 has demonstrated its superiority in both competitive field demonstrations and in actual use. Prove it to yourself. Wire, telephone, or write:



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PAR AVION

By ANTHONY VANDYK



• **Back seat engines**—Why is there such a trend in the transport manufacturing industry to locate the engines in pods at the rear of the fuselage? Vickers-Armstrongs (Aircraft) has summarized the reasons about as succinctly as we have ever seen. Here's the Vickers pitch: performance is improved because the clean wing gives maximum lift and minimum drag resulting in better take-off approach and landing speeds and higher takeoff weights and payloads, low asymmetric thrust makes the effect on handling slight in the normal critical case of outboard engine failure at takeoff.

There is no danger of the engines touching the ground even on large angles of roll. "Pavement blast" on the airport is eliminated. Structurally, heavy local transient loads as at pod attachments are avoided. There is no additional flutter problem, and the stiff wing is better able to prevent onset of control reversal. The jet efflux is clear of the main structure and maintenance costs are thereby reduced.

Maximum protection is given to engine intakes from stones, slush and water. There is no slush-thickness restriction on takeoff. The turbine planes are such that fragments of turbine cannot strike passengers, fuel lines, or fuel tanks. Engine in-flight fires can be confined to individual engine installations and cannot spread to main fuel tanks or lines.

Hot engines cannot be torn off in a wheels-up landing or put into spilled fuel from tanks. Wing tip dig-in is unlikely. There is no risk to ground staff from air intakes. And—a very important point—there is much less cabin noise and vibration.

• **Lufthansa perks up**—Lufthansa is becoming increasingly concerned about competition from other airlines in the German market. At present the German flag carrier transports only about one in four on international flights from Germany. Moreover, foreign airlines still carry some 20% of all passengers on German domestic routes.

Notwithstanding the revival of Lufthansa in 1955, foreign airlines have increased their operations through Germany since that year. Lufthansa cites the following examples: KLM increased its flights to or through Western Germany from 66 in the summer of 1955 to 90 in the summer of 1959; Swissair's flights went from 59 to 65 and Sabena's from 57 to 71.

Lufthansa still operates a small number of flights compared with those of its competitors serving the German market. For example, this summer Lufthansa flew an average of 18 services weekly from Germany to North America compared with 59 services operated by its competitors. The number of flights to England was 32 per week against 137 operated by competing airlines. And from Germany to the Near East Lufthansa's eight flights contrasted with 56 operated by competing airlines.

The expenditure of foreign airlines in Germany on advertising and publicity far exceeds Lufthansa's budget for these items. Lufthansa reports that

in the summer of 1959 it spent only \$68,000 on advertising and publicity in Germany, a mere 13% of the total spent by its main competitors, Pan American, which spent \$179,000 and KLM, \$73,000.

• **Turbines are great**—We recently had an opportunity to travel on scheduled services aboard aircraft which previously we had only sampled on demonstration flights. We rode a Cathay Pacific Electra from Tokyo to Hong Kong and a Caravelle from Geneva to Paris. The Electra was the same one that carried out the Lockheed demonstration flight to Europe, the Middle East and India in 1958.

It was not really a representative aircraft since the first class seats were placed in the front of the cabin and the tourist class accommodations in the middle and at the back. Cathay Pacific plans to change this configuration so as to give the first class passengers the benefit of the ultra-quiet rear portion of the aircraft.

There is no question that the Electra is fast. We left 45 minutes late but arrived in Hong Kong on schedule. Those four Allison 501 engines, attached in ugly nacelles to the wing, really move the aircraft along—cruising speed is not far short of the Caravelle's. Up front the crew works in conditions of exemplary comfort and spaciousness and enjoys visibility that has never previously been found in a Burbank-built transport (our Captain commented that maybe Lockheed had had Convair or Douglas design the Electra cockpit!).

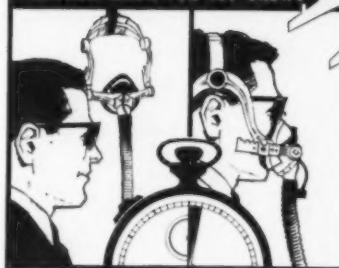
The flight on the Caravelle was hardly representative since Geneva-Paris must surely be the world's shortest jet route (224 mfls) but it proved that the French jet is still undoubtedly the quietest riding transport in the air (even though the latest production aircraft have less soundproofing than prototypes and initial production models).

• **French ups and downs**—Air France's accounts make interesting although difficult reading. Last year the French flag carrier lost some \$8 million on long-haul international services and about \$5 million more on European and domestic operations. Its North African and French Commonwealth services brought in a profit of some \$5 million. However, the French government subsidizes the operation of international services and for 1958 contributed about \$10 million.

In previous years the French government paid the airline a subsidy for operating the Breguet Deux Ponts but last year this was not needed. Air France's participation in certain foreign airlines was expensive—some \$200,000 of "exceptional expenditure" was incurred in connection with Air Liban, one of the three major Lebanese airlines (all three sustained sizable losses in 1958—BOAC and SABENA, respectively, had to make good the Middle East Airlines and Lebanese International deficits).

For the record, the conversions from francs to dollars in this report have been made at the current rate of 500 to the dollar.

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New Wings for the Eagle!

World War II's famed Eagle Squadron, now the 335th Squadron of TAC's Fourth Fighter Wing will soon be flying the F-105 fighter-bomber.

Plane "Bomber Formation" Holley for Fuel Control

World's most powerful one man airplane, is reported to carry "as much destructive power as an entire big bomber formation of World War II." Capable of carrying an atomic bomb, the exciting Republic "Thunderchief" gets more than 25,000 pounds of thrust from its Pratt & Whitney Aircraft J75 jet engine with afterburner.

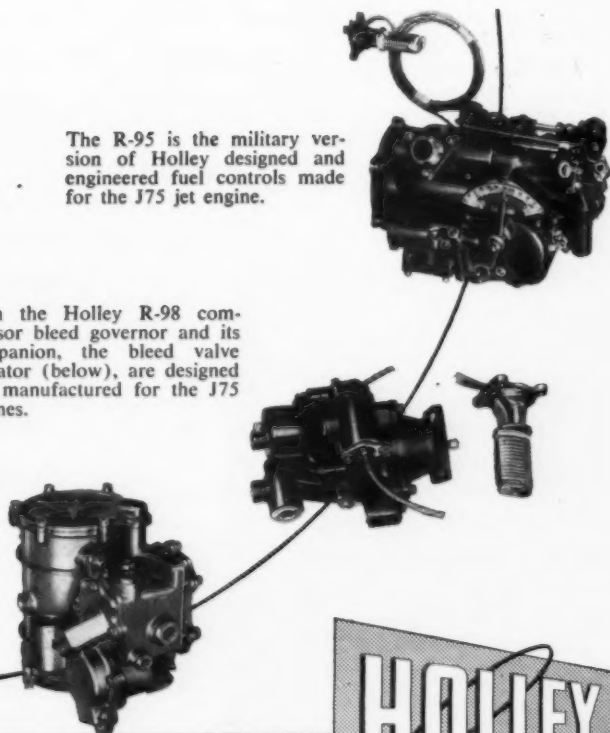
Holley designed, engineered and manufactures the main fuel control, bleed governor and actuator for the J75 engine which has both military and commercial applications. The Holley R-95 control combines "small package" design with light weight and exceptional performance reliability. It's another important reason why more and more engine and air frame manufacturers are turning to Holley for engine components.

This impressive array of fire power shows why the Republic F-105 supersonic jet is often billed as the "one man airforce."



The R-95 is the military version of Holley designed and engineered fuel controls made for the J75 jet engine.

Both the Holley R-98 compressor bleed governor and its companion, the bleed valve actuator (below), are designed and manufactured for the J75 engines.



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WARREN, MICHIGAN

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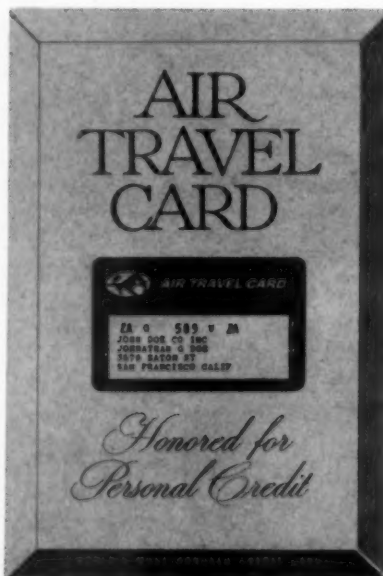
Counterattack on Credit, UATP Drive Goes All Out

The big push is on to expand the use of the "world's most honored credit card"—the airlines' own Universal Air Travel Plan—among hotels, motels and car rental companies.

More than 250 such establishments have already decided to allow their customers to "charge it" on air travel cards, and another 600 have responded to the promotional campaign by writing the Air Traffic Conference for information and application forms.

Combatting "outside" credit plans that have membership fees and service charges, such as Hilton Carte Blanche and Diner's Club, UATP is telling prospects: "You can increase your business without increasing your overhead. You can have the advantage of direct billing. Pay no membership fees, no service charges, no annual dues, no collection percentages. You gain entree to nearly a million air travel cardholders . . . accessible as a group on no other charge plan." Western Air Lines had previously signed with Hilton and Diner's, and Pacific Air Lines with Hilton (AIRLIFT, Oct.).

ATC has mailed to the prospects a complete "personal credit plan promotion kit," including merchandising aids available from the conference at nominal cost. Examples: enamel outdoor sign at \$4.75 each, counter display card at 50¢, folders at 2¢.



Counter display card for hotels, motels and car rental companies.

Car rental agencies already signed are Hertz, Avis, Nationalcar, Olin's and Tilden. Hotels include all members of Intercontinental Hotel Corp., National Hotel Co., Del E. Webb Motor Hotel Co., Best Western Motels, Western Hotels Inc., Manger, Knott, Albert Pick and Dinkler.

Issuance of the new, streamlined travel card, which contains the holder's address as well as name, makes expanded use of UATP possible in that it permits direct billing.

NWA Tries Organ Music

Now it's live organ music aloft.

Northwest Airlines has installed an organ in one of its Stratocruisers on the New York-Chicago-Twin Cities route to "test passenger reaction." A professional organist does the playing. Music is channeled through public address system loudspeakers, which were modified from five to eight inches in size. Organ fits into the plane's seat tracks, is located on left side, two rows forward of main cabin door. Organist plays for half an hour, then takes a 15-minute break. An electrical converter supplies 115-volt current to the organ from the plane's 28-volt system.

Travel Agents Upheld on Teleticketing

CAB has claimed that the airlines have engaged in a joint undertaking to exclude travel agents from participating in teletype ticketing, and has ruled that this is an "improper restraint on trade."

Teleticketing is used to transmit tickets from machines in airline offices to receivers in customers' offices. Airlines wanted to prohibit teletype transmission of tickets to customers when a commission is paid to an agent on sale of such tickets. They also wanted to ban transmission of tickets to agents' offices via teletype. The carriers pointed out that an agent earns his commission by computing fares, determining routings, writing and delivering tickets. By handling an agent's tickets by teletype, the airlines would be doing most of this work, they added.

CAB said there might be sound business reasons for an airline not wishing to assume some of the agent's duties, "but these economic considerations do not justify all the carriers banding together . . . to restrain . . . agents from participation in a significant phase of the air transportation sales market."

Odds & Ends . . .

Unusual promotion by American Airlines is issuance of a consolidated Washington-Chicago timetable listing first-class nonstops of all carriers. AA, with fastest equipment, is, of course, willing and eager to have the customer compare the schedules. It points out that its Electra is 30 to 35 minutes faster than Capital's Viscount or United's DC-7.

Union Oil Co. of California believes in reciprocating. Its biggest customer for petroleum products is Western Air Lines, so board chairman R. H. Taylor has issued a bulletin: "When flying on company business and at company expense, employees are instructed to fly Western when traveling to areas served by it."

Commuter ticketing has been expanded by Capital Airlines. Plan was first tried on Chicago-Twin Cities route, is now effective on flights serving Washington, Atlanta, Buffalo, Chicago, Cleveland, Detroit, Twin Cities, New York and Pittsburgh. Passenger fills out his own ticket, is billed at the end of the month. Books can be ordered by air travel card holders and by commercial accounts.

New printed form for listing sales leads is being used by all National Airlines offices. Employees fill in leads on conventions, group travel, air freight, etc., and forward form to proper station for follow-up.

Food from Lindy's New York restaurant is now featured on southbound Florida flights by Northeast Airlines. Coach passengers pay \$3 extra for pre-luncheon cocktail and the meal.

United's Jetarama (AIRLIFT, November), DC-8 promotion, drew big crowds. San Francisco attendance was 62,000; Los Angeles, 63,000; Chicago, 66,000; New York, 127,000.

Big customer service training program has been launched by Western. Includes courses in ticketing, check-in and baggage checking, special services, telephone techniques, ramp procedures, cargo handling. It's administered at the local level by station and reservations managers.

Glamour courses are being given to American's ticket counter girls in New York. The agents make weekly visits to a John Robert Powers salon for briefings on makeup and hairdo. Plan may be expanded to other cities.

Next to chewing gum, fastest moving passenger service item on its planes is the benzedrex inhaler, TWA says. The special airline-size miniature has a medically active life of two days.

A "seal of approval" is now given by Scandinavian Airlines System to certain package tours. Each segment of the tour from hotels to sightseeing and restaurants is investigated by company representatives before the package is marked "SAS Recommended."

Smart, readable booklet, "Very important pointers for international travel," is available from Air France. Contains advice on documents needed, travel wardrobe, tipping, shopping, etc.



IN THE AIRLINES



FITZGERALD

Joseph H. Fitzgerald named president of Ozark Air Lines, succeeding Laddie Hamilton, who resigned in August. Fitzgerald, who has been executive v.p. and general mgr., joined Ozark last year after serving as director of CAB's Bureau of Air Operations.

Walter Sternberg, 29-year airline veteran, resigned as National Airlines' v.p.-market development.

George E. Keck elected v.p.-base maintenance of United Air Lines, succeeding W. P. Hoare, retired. Keck is succeeded as asst. v.p.-engineering and maintenance by P. A. Wood, former mgr. of engineering planning.

A. J. (Jack) Brough resigned as v.p. of Allied Maintenance and joined TWA as asst. v.p.-properties and facilities.

James Bassage, formerly with Ernst &



KECK

Ernst consultants, elected v.p.-planning of National Airlines.

Wolfgang A. Kittel, Lufthansa's North and Central America mgr., named to the company's four-man board of directors in Cologne, which governs the airline's technical and administrative divisions. His successor has not been named.

Noel H. Burgess appointed North America sales mgr. of Qantas Empire Airways, based in San Francisco.

Herbert R. Wild, 20-year veteran with Avianca, Colombian airline, elected v.p.-traffic, sales and public relations. Alberto Farias named gen. mgr.-traffic and sales; Jorge de Brigard appointed public relations director.

Henry N. Bartelt named cargo sales mgr. of Western Air Lines. Clay Bernard appointed asst. to WAL's v.p.-administration, based in San Francisco.

Capt. Don Ballard, former Denver flight mgr. of Continental Air Lines, named flight operations mgr., Los Angeles, replacing Capt. H. D. Taneyhill, who returns to line duty.

Ronald K. Carlson, Northwest's director of wage and salary administration, appointed director of employment.

W. Blake Thompson named comptroller of Capital Airlines, and John H. Smith executive director of economic controls. Clifford H. Taylor shifts from assistant director of ground operations to cargo sales mgr.

M. C. Wilkin, a former Slick Airways

sales mgr., returns as general sales mgr. after six years in the trucking industry.

AMONG THE SUPPLIERS

Ivar C. Peterson, former dir. of technical services of Aerospace Industries Assn., appointed asst. to the president of Lear Inc. to supervise technical planning. Daniel W. Layman Jr. named dir. of advertising and public relations.

Richard C. Palmer resigned as v.p. of Fairchild and appointed v.p. of Stromberg-Carlson Div. of General Dynamics, in charge of Washington office. Gregg Coughlin named asst. to president of Fairchild, located in Washington.

J. S. Harris, former mgr. of Shell Oil's aviation dept., named mgr. of a new products and commercial sales group, responsible for six departments, including aviation sales.

OTHERS IN AVIATION

John B. Randolph, veteran airport manager, named v.p. of Hertz Rent A Car, in charge of all airport, rail and hotel locations.

Air Cargo Inc., airlines' pickup and delivery service organization, named Paul D. Lonie and George Garland Jr. as western regional mgr. (Los Angeles) and central regional mgr. (Chicago), respectively.

Earl "Ole" Olson is observing his 30th year as mgr. of Duluth International Airport, Minn.

Two CAB Members Named



GILLILAND



BOYD

Two new members of the Civil Aeronautics Board were named by President Eisenhower, subject to Senate confirmation early next year.

Whitely Gilliland, prominent Iowa Republican and chairman of the Foreign Claims Settlement Commission, received a recess appointment to serve out the term of Harmar Denny, which expires Dec. 31. He is expected to be named to succeed himself for a full six-year term. Alan S. Boyd, 37, Florida lawyer and Democrat, was given a recess appointment to replace Louis Hector, who resigned.

Gilliland, who had served on the Iowa state bench, first came to Washington in 1953 as Assistant Secretary of Agriculture. Denny left CAB two months before his term expires, reportedly to enable his replacement to get a head start on the job.

Boyd, a member of the Miami law firm of Matheson, Paige & Boyd, was an Air Transport Command pilot in World War II and also served in Korea. In 1954, he was appointed to an unexpired term on the Florida Railway and Public Utilities Commission, and a year later was elected chairman.

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Highly Critical Report Urges Rejection of TAN

In one of the most strongly worded examiner's reports to date, CAB's Richard Walsh urged the Board not to renew the foreign air carrier permit of Transportes Aereos Nacionales (TAN), Honduran line, between Honduras and Miami.

Despite a CAB warning to TAN to reduce carriage of fifth freedom traffic between Miami and South America, the line "knowingly and wilfully" increased such traffic, diverting \$1 million a year from U.S. carriers, Walsh said. This was accomplished through formation of "paper" companies, including Compania Ecuatoriana de Aviacion (CEA) and APSA, Peruvian line, he added. TAN operated an interchange with APSA, but Walsh claimed all three companies "are part of a single combine which is controlled by C. N. Shelton," a U.S. citizen. Shelton's testimony in the case was "beyond belief," he said.

TAN refused to submit records and

failed to comply with two subpoenas, Walsh claimed, adding that if CAB found its service required by the public interest "it would in effect be giving the carrier a license to violate the law with impunity."

He also said: "Favorable action . . . would only encourage the carrier to greater excesses in its plan of conquest of the U.S.-South American market."

Detroit-Cincinnati Recommended for LCA

Suspension of TWA between Detroit and Cincinnati via Columbus and Dayton, and award of the route to Lake Central Airlines for five years was recommended by CAB examiner Paul Pfeiffer. LCA's certificate should be withheld pending a showing that it is able to begin service with at least three roundtrips daily using modern pressurized equipment, he said, adding that public convenience does not require suspension of Delta's long-haul restriction which prohibits Cincinnati-Detroit turnarounds.

ROUNDUP OF ACTIONS

ACTIONS

Air-India International was issued a foreign air carrier permit for a route from India to New York.

Trans-Caribbean Airways' request to change its corporate name to Transportation Corp. of America was approved. Company can continue to advertise as Trans-Caribbean if tickets and aircraft carry the corporate name.

Aerovias Sud Americana's certificate was renewed for five years, a number of points were added, and it received authority to carry non-subsidy U.S. mail. Miami was added as a U.S. co-terminal with Tampa/St. Petersburg.

CAB should defer decision on application of Eagle Airways (Bahamas) Ltd. to serve beyond Miami to Palm Beach, Ft. Lauderdale and Tampa, examiner F. D. Moran said. Application should be considered with that of Bahama Airways, and the British government should decide which carrier should compete with Mackey Airlines on the route, he stated, adding that there is not room for two competitors.

Bahama Airways Ltd. has been conducting unauthorized operations between Miami and Bimini, West End, Freeport and Nassau, British West Indies, CAB's Compliance Office charged.

Laurentian Air Services received a three-year foreign air carrier permit for infrequent trips between Ottawa and U.S. points, with certain geographical limits.

TWA was granted permission to suspend polar operations from Los Angeles and San Francisco during the winter season, ending May 1, 1960.

CAB denied a petition by a group of Delta pilots that it reconsider its order refusing to revise Delta's integrated seniority list. Conflict is over the list resulting from the 1952 Delta-Chicago & Southern merger.

APPLICATIONS

Wien Alaska Airlines asked certificate change and exemption to fly Fairbanks-Juneau via Whitehorse, Canada.

Air France requested foreign air carrier permit change allowing it to fly from France to Anchorage, Alaska, via Hamburg, as provided in U.S.-French notes.

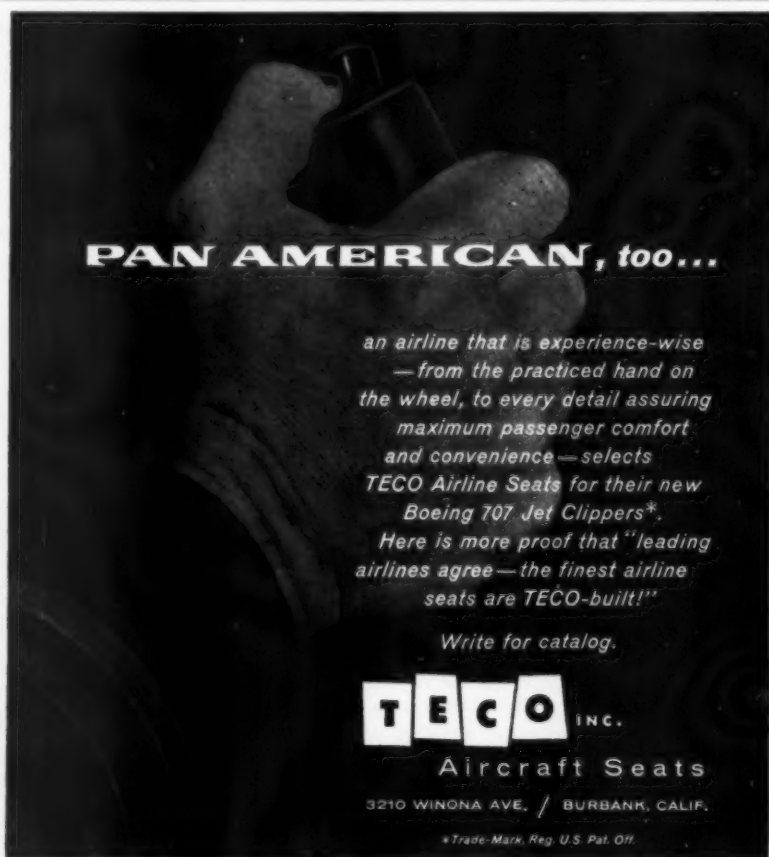
TWA asked CAB to find that Allegheny Airlines is violating Board rules by representing that its book tickets, which are supposed to be non-transferrable, may be transferred and used by persons other than the ones to whom they were issued.

Hughes Tool Co. sought approval of day-to-day lease of Boeing 707-311 and Convair 880 aircraft to TWA. Deal is similar to present one covering 707-131s. Lease would be \$2,940 a day for 707-331s and \$2,070 for 880s.

MAIL RATES

Pacific Northern Airlines asked an increase in its mail rate to \$3,565,465 yearly, and Pacific Air Lines requested a jump to \$3,182,897.

West Coast Airlines was awarded temporary mail rates of \$6,847,355 for the period Dec. 1, 1956 through Aug. 31, 1959, and \$3,841,511 for year beginning Sept. 1, 1959.



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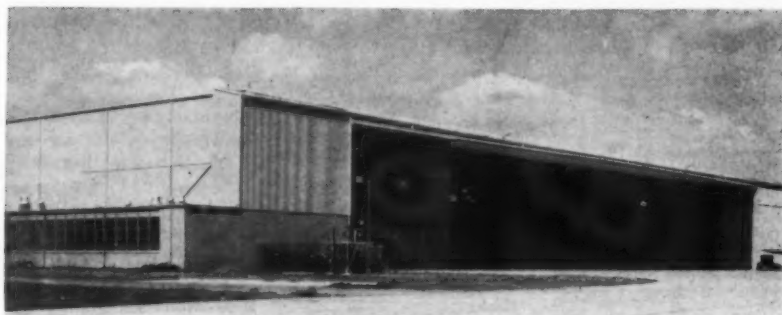
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**Central Airlines
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locals to get new
maintenance quarters.
Here's how they
shape up**

Central is Set With \$1.2 Million Base

A big, roomy home without a lot of furniture cluttering it up—that is Central Airlines' modernistic new maintenance base at Fort Worth's Amon Carter Field, and Central officials hope to keep it that way.

It's been in operation less than three months, but the 36,000 sq. ft. hangar is "home" to office, shop and storage space for 24 of Central's departments.

The \$1,192,563 hangar was built by the city of Fort Worth and is leased by Central for 26 years. There's an optional 26-year renewal. A city-owned office building at the airport also is on lease.

The new installation, a noteworthy improvement over Central's old 1932-vintage base at Meacham Field, 17 miles away, was designed with an eye to the future.

The roof is 38 ft. high at its lowest point so that new, turbine-powered equipment Central is eyeing can enter easily.

The building's outstanding feature is its full cantilever roof, which has no internal supports. The 120 x 300 ft. floor is completely unobstructed and the hangar can easily accommodate eight DC-3s—10 can be squeezed in in an emergency.

Drains and floor-flush telephone connections spot the floor of the hangar. The concrete is sloped so spilled liquids flow toward the drains. The plug-in phone connections augment instruments placed around the hangar wall.

"We've found that the man work-

ing on the plane is the most likely to get a phone call," R. L. Wageneck, v.p. operations, said. "This arrangement saves him time and us money."

Air conditioning keeps the radio and accessory shops and the presently inactive instrument shop livable in the scorching Texas summers, when temperatures on the surrounding concrete ramps often approach 120 degrees. Height of the hangar roof helps lower temperatures in that area and large windows at the rear of the hangar may be opened or closed electrically from the floor to aid ventilation.

Offices and shops are arranged in the form of a T. The hangar formed by the roofed-over area forms part of the T's crossbar. Designed for quick expansion, the hangar could be doubled in size by building a roof over the area opposite the T's stem. This space now is part of a 175-car parking lot.

The office and shop area, now two stories, can be easily enlarged to three floors.

The thing that gives the hangar a "wide-open" look is the lack of major support equipment.

Most support equipment now in the building was moved over from the old base at Meacham Field. Central is holding off on purchase of new equipment until it places an order for new aircraft.

Hangar, shop and ramp equipment, not including equipment used at the nearby passenger terminal, is valued at \$43,000; stockroom inventory is \$225,000 and furniture and miscellany of

\$15,000 make a total of \$283,000 worth of equipment in the hangar.

Most of this, of course, is electronic equipment and spare parts, not maintenance equipment.

Virtually all of the support equipment was picked up on the surplus market, because it was available and because the price was right.

"We have purposely kept piston-engine support equipment to a minimum because we know jets will require new and different support equipment," Wageneck said.

Central's philosophy regarding major support equipment is that the firm with the most equipment and employees is not necessarily the best off in the maintenance field.

The line uses a non-progressive maintenance system coupled with heavy reliance on small overhaul shops to keep its fleet flying. It expects to do the same with any future aircraft.

"In an area such as this, where there are a lot of good overhaul shops, we farm out everything we can where we can get a good shop to do a quality job at a reasonable price," Wageneck said.

The line feels that a firm specializing in one particular aspect of maintenance can do a better job in that field than Central's own shops can.

At present, engines are overhauled every 1,200 hrs., airframes every 12,000. Both receive 120 hr. periodic checks. Engines are removed, stripped of accessories and shipped to one of two engine firms—Dallas Aero Service

MAINTENANCE

or Dallas Airmotive, Inc.—for overhaul.

The accessories and propellers are sent to Cooper Accessory and Propeller Repair in Dallas; carburetors go to Aircraft Carburetor Repair in Garland, Tex., and instruments are farmed to Airline Instrument Repair Co. at Meacham Field.

Central's shops do the power-egg buildup with the overhauled components and reinstall the engines.

Horton & Horton, a custom aircraft interior firm, recently began styling Central's aircraft interiors.

Only cost increases encountered in operation of the new base were direct moving costs from the old installation. Central expects no "break-in" costs with the new base.

It's opening already has eliminated seven round-trip ferry flights daily to Meacham Field with a resultant saving of \$4,500 monthly. The trips averaged 12 minutes each way in good weather and up to 40 minutes when weather was poor.

Passenger schedules are so arranged that a plane normally is out of the shop five days, but they can stay away as long as two weeks.

In case of emergency, schedules are theoretically arranged to allow any one piece of equipment to reach Fort Worth in one day. But, of course, theory isn't always translated into reality.

The hangar is staffed by 82 maintenance employees and 129 others, including flight crews, who work out of the building's offices.



Ethiopian Slashes Costs With New Overhaul Shop

A new \$900,000 engine overhaul shop set up by Ethiopian Airlines in Addis Ababa is expected to pay that carrier big dividends in reduced cost of operation.

The new facility, set up to overhaul R2800s for Ethiopian's DC-6Bs, becomes the only facility on the African continent capable of handling the 18-cylinder Pratt & Whitney engine.

And, according to general manager Victor H. Harrell, Jr., it will permit the airline to cut deeply into its engine overhaul costs. In the past it required six months to ship an R2800 to the U.S. for overhaul and return. Costs ran anywhere from \$12,000 to \$14,000 per overhaul.

With its own shop, Harrell figures the airline can do the job in three to four weeks. It will be able to cut its inventory of R2800s by about eight engines and that of R1830s for DC-3s by 15 to 18 engines.

With a big cut in time and transportation charges and figuring a two-engine-per-month rate for the new shop, Harrell expects Ethiopian will overhaul the engines for \$6,000 to \$7,000 or half the past cost. With these savings, it is expected the shop will amortize itself in about five years.

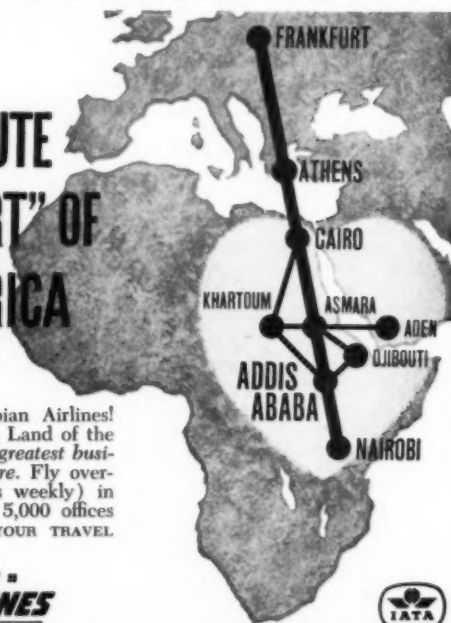
The new shop, which measures 120 ft. square, will employ about 46 technicians and is headed by R. D. McRae who joined Ethiopian in Addis Ababa in 1957 to supervise construction.

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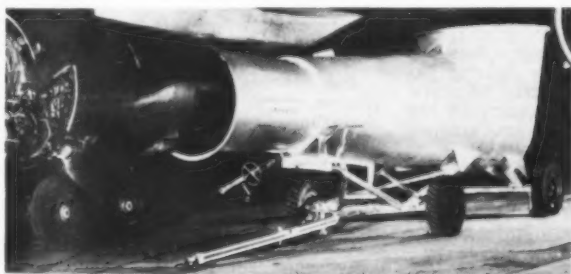
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Ethiopian's general manager V. H. Harrell, Jr., left, congratulates engine shop foreman R. D. McRae after first R2800 is overhauled in new shop.



When a Boeing 707 took to the air on the nation's first regularly scheduled flight in January of last year, the event brought into the backyard of millions of Mr. and Mrs. Americas a new sound—and a stunning, overpowering amount of it to boot. No longer the sole endowment of military air bases, this rushing, gushing bellow above the once placid chimneys of suburbs across the land soon threatened the peace of mind of the airline industry itself. Beset by a bevy of telephone protests, carriers turned prayerfully to makers of military anti-jet-noise devices with pleas for help—and pronto. There was little more they could do to lessen the jet roar once the airplanes left the ground, but they urgently sought mobile baffles which would muffle on-the-ground runup noise during engine testing. The result: so-called jet noise silencers (none are really very silent) of which five strictly portable models are shown below.



General Acoustics

General Acoustics Corp.'s model AE-15 cuts runup noise to "levels not objected to by personnel and nearby home owners". It's all steel, 28 ft. long by 8 ft. wide by 9 ft. high, and is mounted on a lightweight, rubber tired undercarriage.

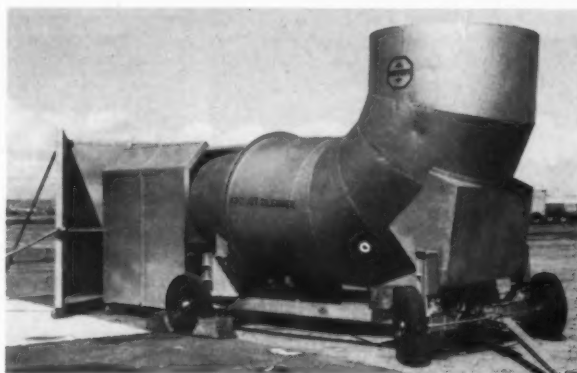
Write: Dept. A/L, Attn: Cloyd Smith, General Acoustics Corp., 12248 Santa Monica Blvd., Los Angeles 25, Calif.



Emhart

Noise reduction of 25 to 30 db is claimed for a suppressor made by Emhart Mfg. Co.'s Maxim Division. The JEC-8, which is engineered to operate with all current jet engines, is a portable, all metal spoiler type with a maximum weight of 10,000 lb.

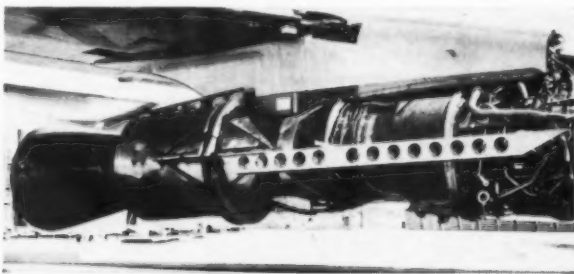
Write: Dept. A/L, Emhart Mfg. Co., Maxim Div., 760 Windsor St., Hartford 1, Conn.



Koppers

Working with Martin Aircraft in Baltimore, the Koppers Co. has come up with a portable model said to cut noise by 30 to 35 db at the critical radius. A mechanical jack raises and lowers the sound suppressing unit which is built on wheels for easy mobility.

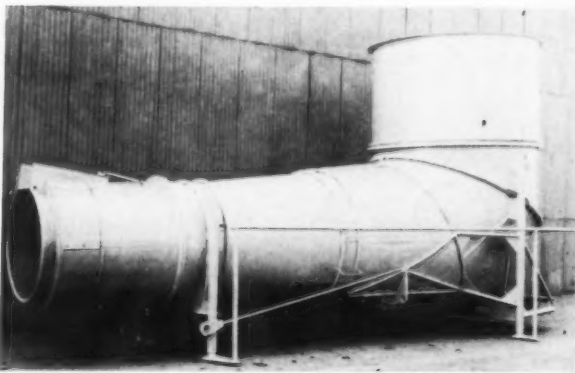
Write: Dept. A/L, Koppers Co., Metal Products Div., Scott and McHenry S.S., Baltimore 3, Md.



Industrial Acoustics

A trailer which can be moved by one man carries Industrial Acoustics' universal UDAC suppressors to aircraft where they can be directly attached to the engines' ground handling mounts. They chop noise up to 32 db. Ten have been sold.

Write: Dept. A/L, International Aerocoustics Division, Industrial Acoustics Co., Inc., 341 Jackson Ave., New York 54.



Air Logistics

A reduction of more than 31 db is claimed for Air Logistics Corp.'s Model 11020, which is said to eliminate the need for ear plugs at the critical 250 ft. radius. Mounted on heavy duty casters, it can be hydraulically adjusted for engines 42 to 108 in. high.

Write: Dept. A/L, Air Logistics Corp., 3400 E. Foothill Blvd., Pasadena, Calif.



Toilet Service Truck

A ground service truck for toilet servicing in Douglas DC-8 and other jet aircraft has been designed by Wickland Manufacturing Co.

The truck has a waste capacity of 130 gals., enough to service two aircraft. Waste is re-circulated during the cleaning process, necessitating a recharge tank requirement of only 35 gals.

The servicing operation takes 4 min. The proper amounts of disinfecting chemicals and recharge liquids are automatically dispensed, while a vacuum pump system aids waste removal and cleansing.

Write: Dept. A/L, Monogram Precision Industries, Inc., 8557 Higuera St., Culver City, Calif.

Portable Scaffolding

Portable, tubular aluminum scaffolding that can be erected anywhere to practically any usable size is manufactured by Up-Right Scaffolds, Berkeley, Calif. The scaffolding goes up quickly to provide convenient access to all sections of an airframe, to speed airline maintenance, overhaul or painting.

The structure is made of one-piece folding sections which can be stacked and bridged into the proper configuration. Lightweight but strong, the scaffolding rolls on casters and can be easily moved or disassembled.

Write: Dept. A/L, Up-Right Scaffolds, 1013 Pardee, Berkeley, Calif.

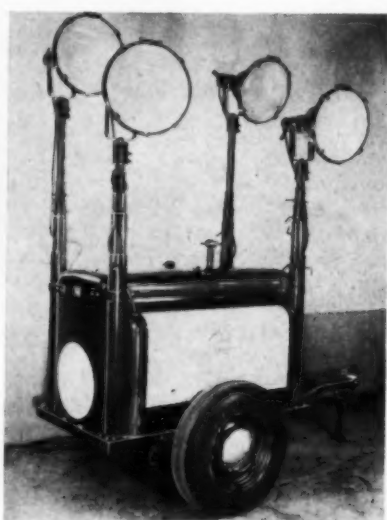


Crop Sprayer

Pictured is new crop spraying equipment developed by Agricultural Aviation Engineering Co. for Hiller UH-12E helicopters.

The fiberglass reinforced plastic tanks have a capacity of 150 gal. and can be used with wet or dry material. The equipment dismounts quickly. Booms fold for storage.

Write: Dept. A/L, Agricultural Aviation Engineering Co., 858 Scitt St., Santa Clara, Calif.



Mobile Flood Lights

A trailerized flood lighting unit that generates its own power for emergency hangar, aircraft or taxiway lighting has been developed by Pacific Mercury. Called "mobile", the rollaway unit has four floodlight units and can generate 500,000 candlepower.

Lights are adjustable up to 18 ft. and pivot through a complete circle.

Ten extra outlets for power tools or emergency equipment are provided. The generator has a capacity of 10,000 w.

Write: Dept. A/L, Marketing Div., Pacific Mercury, 14052 Burbank Blvd., Van Nuys, Calif.



Business Autopilot

A 27-lb. autopilot capable of "airliner-control" for executive and business planes has been developed by Sperry Phoenix division of Sperry Rand.

The equipment is adaptable to single or twin-engine aircraft. It can be added unit by unit if operators don't want to start with the complete system.

Five-lb. computer-actuators fit most small aircraft without custom engineering. The basic system is priced from \$1,500 to \$4,000, depending upon degree of flight control.

Write: Dept. A/L, Sperry Phoenix Co., Div. of Sperry Rand Corp., Phoenix, Ariz.

INFO FOR THE ASKING

Safety vacuum cleaner—Spencer Turbine Co., Hartford, Conn. has issued a bulletin describing its new Air Jet portable vacuum cleaners designed for use in hazardous areas. Powered by compressed air, the units have no electrical parts and operate completely spark-free.

Write: Dept. A/L, Spencer Turbine Co., 486 New Park Ave., Hartford, Conn.

Bright paint—Dupont, Wilmington, Del. offers a folder on potential uses and merits of "Pyralux" fluorescent enamel. The high visibility material in colors four times brighter in daylight than conventional hues is advanced as a safety marking for aircraft.

Write: Dept. A/L, Public Relations Dept., E. I. du Pont de Nemours & Co., Wilmington, Del.

Air blowers—Folder from Plennair shows how air movers are in use on several British aircraft, and lists blowers to meet a variety of needs.

Write: Dept. A/L, Plennair Limited, Leatherhead, Surrey, Gt. Britain.

For Your Bookshelf

Our growing private fleet—FAA publication, "U.S. Active Civil Aircraft by State and County" shows 4% jump in number of active civil aircraft in 1958 over preceding year. Booklet dissects figures by state population and area, costs 55¢ from U.S. Government Printing Office, Wash. 25, D.C.

Building an airport?—Then read revised edition of IATA's "Airport Buildings and Aprons," \$2 from IATA Technical Secretariat, Terminal Centre Bldg., 1060 University St., Montreal 3, P.Q., Canada. Written for jet expansion, the 179-page book has all the basic information of the 1956 first edition and last year's "Apron Requirements for Turbine Powered Aircraft" plus new material based on recent experience with jets and turboprops.

NOTES ABOUT SUPPLIERS

• Hiller Aircraft has been granted exclusive rights to Bolkow BO 102 Helicopter in U.S., Canada, Mexico and Central America. The BO 102 is a single-seat, single rotor helicopter which is linked to the ground by a stationary pivot mounting. An advanced model is mounted on a float. Helicopter operates at one-fourth the cost of flying models, achieves realism unattainable in simulators.

• Exhaust Parts, Inc. has expanded manufacture of exhaust system parts to include Martin 202s and 404s and DC-3s. The company produces systems for R3350 turbo-compound engines, DC-6s and Convairs. Catalogs are available.

• Air Associates has moved its Cleveland warehousing facilities to Port Columbus Airport, Columbus, Ohio. The shift was made to centralize Ohio and Kentucky services and to acquire more space.

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Shopping Spree in Kabul

The native markets in Kabul, Afghanistan are certainly among the most colorful and interesting in the world. Not only are they unspoiled by tourists, since very few of these ever get into that country, but they look just as they must have looked three or four centuries ago. Things haven't changed much yet in that landlocked country.

The best market is a long, meandering alley running between two rows of stalls parallel to, but a block back from, one of the main streets. In it you jostle burros and tribal people. The various types of Moslem garments and headgear are right out of history.

My wife and I were taken to the market by Mr. and Mrs. Frank Swayze. He's the executive vice president of Ariana, the Afghan airline 49% owned by Pan American.

Most stalls were raised about three feet off the ground and on the platform amidst Persian rugs sat the owner, usually bearded and usually in Moslem robes with a turban around an Uzbek or other type of round embroidered hat found in Central Asia.

The goods were all over the place, hanging on poles extending into the lane, hanging from rafters and piled up in the rear of the platform—everything from pots and pans to fancy embroidered jackets and hats. No items for the tourist, as such, but my eyes went immediately to the brilliant red, blue, green

and yellow short-sleeved jackets which Afghans wear as a sign of wealth for special occasions.

I stopped at one stall and decided to make a purchase with Swayze in charge of bargaining—one never pays the asking price in an Afghan market. I started to try on a jacket over my suit coat and heard an outcry of protest and a lot of laughing. I had attracted quite a crowd of Afghans who considered this westerner to be sort of a spectacle, as I guess I was, because a western suit with shirt and tie was an oddity in that market for sure.

The Afghans, having a great time, were protesting that I couldn't put the jacket on over my suit coat. So I took off my coat and then put on the jacket, at which point the crowd cheered. But the shop owner must have been fearful that the crowd might scare away a customer so he called a local gendarme to scatter the curiosity seekers. I finally bought a brilliant red jacket and a hat and while I won't be so immodest as to say I'm the life of the party, I have worn the outfit at a few social occasions. That's just the tourist coming out in me. Next I'll be addressing ladies' teas, may Allah be pleased.

Anyway, believe me, Afghanistan is a never ending spectacle of an old country going about its business pretty much as it has done for many centuries. It is a pageant of colorful wearing apparel, of

camel trains, of gypsies and tribes, and old customs, and people with smiles and fascinating expressions. But back of this National Geographic outlook is the grim ideological struggle between the U.S.S.R. and the west and he would indeed be a prophet who could foretell the outcome.

One day Swayze took me on a regular Ariana DC-3 flight to Kandahar, several hours south of Kabul, and then west about 550 miles over completely arid country to Herat, an old, historic city of 100,000, a western outpost for the Afghans which has seen the conquest of the Macedonians and the hordes of Genghis Khan and many others.

By air it's an eight-hour round-trip, including stops, but by surface it's a three or four day expedition one way. If one likes the desert, there is a certain forbidding beauty about it, otherwise it is awesomely desolate. The one road will make a wreck of a new automobile in nothing flat.

There is nothing but an unpaved strip at Herat but after takeoff we circled the old city with its many huge mosques and several old forts, one of the most interesting glimpses of ancient history I've ever had.

Kandahar, the junction point in the south of the country, is an old Moslem city, but outside the town is now one of the finest jet-age airports in that part of the world, built with American funds and engineering. It has a 10,500-foot runway, black-topped, fine taxi-ways, and several big surplus B-36 hangars.

At 3,500 feet elevation, in the midst of the desert, the summer temperature goes to 125 degrees Fahrenheit and stays there. But this is the international airport for the country, since the unpaved airport at Kabul is strictly limited by terrain and weather. Kandahar is the express stop—and a fine alternate for jet services in that part of the world.

I didn't envy the PAA men who were building Ariana into an airline, men like Ralph Rhea, operations manager, but he's tackled tough jobs before. Frank Murphy, sales manager, and Bjorne Ferdinandson, controller, are based in Kabul. Some of the men I met in Kandahar have since departed for home—including old-timer Bill Jakeman, chief pilot; Ben Pabst, maintenance, and Ralph Peterson, commercial manager.

Most of Ariana's pilots are Indians and they do an excellent job—and piloting out there means a lot more chores than in the U.S. On the Herat trip I had Captain I. J. S. Mahna, and on the Karachi run later I had Captain K. I. Eapen, both veterans.

Mahana told me how he flew a DC-3 at 18,000 feet once. He took off with full load from an airfield north of the high Hindu Kush range, had magneto trouble, decided it was then or never, managed to climb to 18,000 feet, then coasted over the range and down to Kabul at 6,000 feet. You've got to be resourceful in Afghanistan or you just ain't goin' to make it.

But Ariana has progressed. It now has a weekly DC-4 flight to Frankfurt. It hauls tons of caracul and other hides in Beirut for shipment to London and New York. It carries thousands of Moslem to Mecca. And it has become the lifeline in one of the least developed countries of the world. It has maintenance problems with dust and Russian gas which would try the soul of any maintenance man (it has to overhaul engines at 750 hours), but it's coming along and has had but one accident.



U.S. State Dept. Photo.

Streaks of the jet age in the hot, burning desert outside Kandahar in southern Afghanistan. U.S. aid has built this 10,500-foot runway. One hangar is under construction at lower left.



Photo by WWP.

Using methods as old as history itself, two workmen are seen at the new terminal under construction at Herat in western Afghanistan.



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